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A STUDY OF USER ACCEPTABILITY OF THE AIR FORCE  
COMMUNICATIONS-ELECTRONICS (C-E) SYSTEM OF VAMOSCO(U)  
DESMATICS INC STATE COLLEGE PA JUN 87 TR-110-13

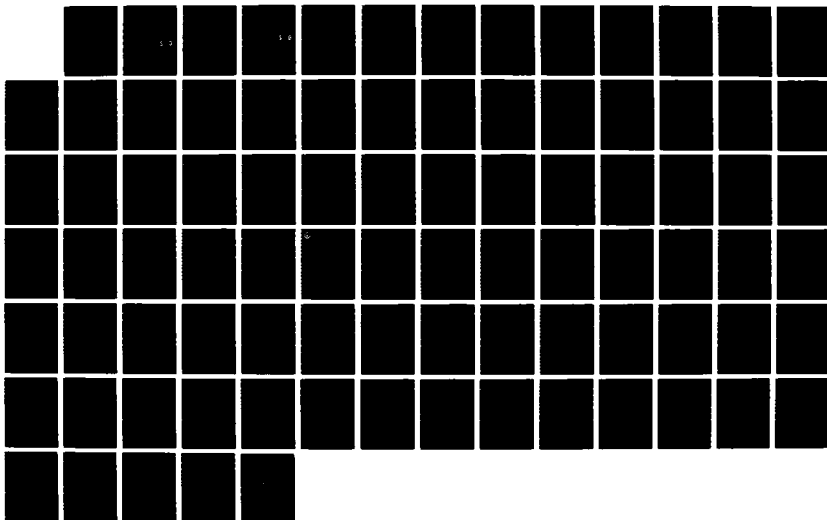
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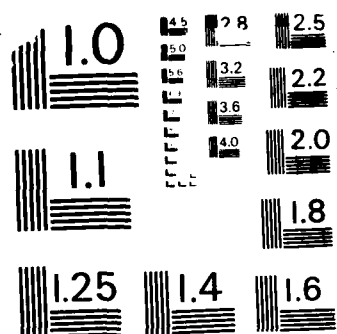
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THE AIR FORCE COMMUNICATIONS-ELECTRONICS  
(C-E) SYSTEM OF VAMOSC

by  
Desmatics Staff

— STATISTICS —

— OPERATIONS RESEARCH —

— MATHEMATICS —

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DESMATICS, INC.

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*Applied Research in Statistics - Mathematics - Operations Research*

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TECHNICAL REPORT NO. 118-13

Original Draft May 1987  
Final Draft June 1987

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report documents the results of a C-E system user acceptability study. Since the C-E system is not yet a mature system, it is currently not being used extensively. The study had five primary goals: 1. to identify potential users of the C-E system 2. to inform them about the type of cost information which the C-E system is designed to provide. 3. to determine the usefulness of the current system products 4. to gather user ideas for improvements to the C-E system and its products		

20. Cont

5. to obtain information about the anticipated use of COSTCASTER, a cost-prediction and trade-off model for Air Force ground C-E equipment.

This report contains the background of the study, development of the survey, analysis and discussion of the survey results and conclusions.

It must be stressed, however, that in order for the C-E system to be helpful in practice, as well as in theory, it must produce output products which provide accurate and complete cost information. Unfortunately, the system was placed in operation while it still contained significant defects. Although corrections to a number of those defects have been specified, they do not include the most significant ones. These involve deficient depot and base-level maintenance input data. The Office of VAMOSC has decided, therefore, to suspend operation of the C-E system. Thus, the survey results are currently moot. However, should the decision be reversed in the future, the information obtained through this survey should prove of value to the Office of VAMOSC in assessing the usefulness of the C-E system products and possible modifications that should be made to those products.



## I. INTRODUCTION

Desmatics, Inc., under Contract No. F33600-82-C-0466, is conducting an evaluation of the Communications-Electronics (C-E) subsystem of VAMOSC, the Air Force Visibility and Management of Operating and Support Costs system. The C-E system, D160A, collects and displays Operating and Support (O&S) costs for items of ground communications-electronics and meteorological equipment.

This report documents the results of a C-E system user acceptability study. The Statement of Work for this task stresses the importance of having the C-E system meet the needs of its user community:

"The D160A (C-E) subsystem of the VAMOSC system has been designed in part to aid in high level decision-making activities related to acquisition planning, trade-off analyses, and budgeting by HQ USAF, DOD, and defense contractors. It is important that the C-E system meet the needs of its user community and that the Office of VAMOSC be responsive to these needs. Therefore, the Office of VAMOSC intends to assess the utility and acceptability of the C-E system and its output products to its users."

Because the C-E system is not yet a mature system, it is currently not being used extensively. Thus, the Desmatics acceptability study focused primarily on potential, rather than current, users of the C-E system. The study had five primary goals:

- (1) to identify potential users of the C-E system,
  - (2) to inform them about the type of cost information which the C-E system is designed to provide,
  - (3) to determine the usefulness of the current system products,
  - (4) to gather user ideas for improvements to the C-E system and its products,
- and (5) to obtain information about the anticipated use of COSTCASTER, a cost-prediction and trade-off model for Air Force ground C-E equipment.

The user acceptability study was based on the administration of a survey.

The background of the study, development of the survey, analysis and discussion of survey results, and conclusions are addressed in the following sections of this report.

## II. BACKGROUND

This section describes the background of the Desmatics C-E system user acceptability study, which was based on the administration of a written survey to the C-E system user community. This community, as defined in the context of this report, includes both current and potential users of the C-E system. Because the C-E system has not yet evolved to maturity, the latter category prevails. Determining the nature and extent of the user community began with the compilation of a list of specific individuals/offices who were, in the judgement of Desmatics, current or potential users.

Desmatics' initial list of users/potential users consisted of attendees of the May 1984 Tri-Service VAMOSC Conference who indicated interest in the C-E system and attendees at C-E/COSTCASTER briefings. The Office of VAMOSC reviewed this list and made a number of additions, including individuals who had requested C-E system output.

In order to locate additional users/potential users, a letter requesting the names and addresses of individuals who might be potential C-E system users was prepared by Desmatics. An attachment to the letter provided a brief description of the C-E system. After a review of the letter by the Office of VAMOSC, it was signed by the HQ USAF/LEYE Deputy Chief and then mailed to the individuals/offices on the initial list. A copy of the letter and the attachment describing the C-E system is provided in Appendix A. Of the letters mailed, 18 were returned. Most of these responses identified a number of potential users. A master list for the survey mailing was compiled from these responses.

### III. C-E SYSTEM USER SURVEY

The major part of the C-E system user acceptability study consisted of the design, administration, and analysis of a written survey. Questions included in the survey were developed by Desmatics based on its knowledge of the C-E system and on information obtained from attendees of C-E/COSTCASTER briefings. The survey was constructed through a series of drafts which were reviewed internally and revised. A draft was then submitted to the Office of VAMOSC for approval, and after minor modification the final version was prepared.

The survey, which was mailed to a total of 113 addressees (offices/individuals) on the master mailing list, was accompanied by a set of four attachments to be used as reference when completing the survey:

- Attachment 1: Overview of the Ground Communications-Electronics (C-E) System
- Attachment 2: C-E System Output Products
- Attachment 3: C-E System Standard Products-Sample Reports
- Attachment 4: COSTCASTER: Cost-Prediction/Trade-Off Model for Ground C-E Equipment

A postage-paid business reply envelope was included with the survey for its return. A copy of the survey and its attachments is given in Appendix B.

The surveys were mailed in January 1987. Approximately four weeks later the Office of VAMOSC sent a follow-up letter. In all, a total of 47 surveys were returned, a response rate of 42%.

The survey itself consisted of a total of eighteen questions of three types: multiple-choice, rating-scale, and open-ended. For the sake of brevity and ease of response, most questions were of the first two types.

Background questions requested the respondent's name and address (optional), type of employer, and work-related tasks involving C-E equipment. Respondents were asked if they have a current or future need for &S cost information on C-E equipment. Those responding in the affirmative were asked a series of questions designed to assess the usefulness of the C-E system and the COSTCASTER model in their current or future work. In addition, these respondents were asked for suggestions for enhancements to the C-E system and its outputs.

#### IV. RESULTS AND ANALYSIS

Survey respondents were classified into two main groups according to whether or not they are "potential" users of the C-E system. The respondents classified as POTENTIAL C-E USERS were requested to complete the entire questionnaire. The respondents classified as C-E NONUSERS were requested to answer only questions to identify their current employer and the type of tasks they perform which involve C-E equipment. In subsection A, the respondents are categorized according to their current employer and their need for and familiarity with the C-E system. In subsection B, the responses to each survey question are summarized and analyzed.

##### A. CLASSIFICATION OF RESPONDENTS

Based on responses to Questions 2, 4, and 7, each respondent was categorized according to current employer and need for and familiarity with the C-E system. This categorization is summarized in Table 1.

The row classification in Table 1 corresponds to the respondent's employer. The column classification refers to the type of need for and familiarity with the C-E system. Five categories are identified; these are:

NO NEED FOR C-E,  
NEED: NEVER HEARD OF C-E,  
NEED: HEARD OF C-E BUT NOT SEEN C-E,  
NEED: HEARD OF AND SEEN C-E,  
and NEED: C-E USER.

Classification into these five categories was based on the responses to Questions 4 and 7, which inquired about the respondent's need for and degree of familiarity with the C-E system.

EMPLOYER	NO NEED FOR C-E	NEED: NEVER HEARD OF C-E	NEED: HEARD OF C-E BUT NOT SEEN C-E	NEED: HEARD OF AND SEEN C-E	NEED: C-E USER	ALL CATEGORIES
AIR FORCE	13	2	17	5	1	38 (81%)
DOD CONTRACTOR	1	-	3	2	1	7 (15%)
DEPARTMENT OF DEFENSE	1	-	-	-	-	1 (2%)
NAVY	-	-	-	1	-	1 (2%)
TOTAL RESPONDENTS	15 (32%)	2 (4%)	20 (43%)	8 (17%)	2 (4%)	47 (100%)

POTENTIAL C-E USERS: 32 (68%) Respondents

→ C-E NONUSERS: 15 (32%) Respondents

Table 1. Respondent Categorization

Each respondent was subsequently classified as either a POTENTIAL C-E USER or a C-E NONUSER for purposes of analysis. A respondent was classified as a POTENTIAL C-E USER if he/she indicated a current or future need for O&S cost information on C-E equipment. If no such need was indicated, the respondent was classified as a C-E NONUSER.

As previously mentioned, a total of 47 surveys were returned to Desmatics, Inc. for analysis. A breakdown of these 47 surveys showed 38 (81%) were Air Force employees, 7 (15%) were DOD Contractor employees, 1 (2%) was a DOD employee, and 1 (2%) was a Navy employee. Only 2 (4%) respondents had actually used C-E system output products prior to this survey. Furthermore, 32 (68%) respondents were classified as POTENTIAL C-E USERS and 15 (32%) were classified as C-E NONUSERS.

#### B. ANALYSIS OF SURVEY QUESTIONS

The following pages provide a summary and analysis of the responses to each survey question. Note that Question 1 is not discussed because it was an optional question requesting the respondent's name and address.



```

*****
*
*      Question 2.  Who is your current employer?
*
*      81% Air Force      2% Dept. of Defense
*      0%  Army          15% Dept. of Defense contractor
*      2%  Navy          0% Other, please specify:
*
*****

```

All respondents (N=47) were requested to answer this question, and there were no nonresponses. A look at the results above shows that the majority of respondents, 81%, were Air Force employees. The only other category with a significant share of respondents was that of the Department of Defense Contractors, which accounted for 15% of the respondents.

```

*****
*
*      Question 3. Which of the following tasks involving C-E
*      equipment do you perform in your work? Please check all
*      that apply.
*
*      13% My work does not involve C-E equipment
*      28% Life cycle cost management
*      36% Trade-off analysis
*      32% Budget preparation
*      38% Life cycle cost modeling/forecasting
*      43% Reliability/maintainability studies
*      40% Logistics forecasting/management
*      21% Manpower forecasting/management
*      45% Systems comparison (existing or conceptual)
*      6% DSARC submissions
*      30% Evaluate product performance agreements
*           (warranties, maintenance agreements, etc.)
*      40% POM submissions
*      21% Other(s), please specify:
*
*****

```

All respondents (N=47) were requested to answer this question. There were no nonresponses to this question. Table 2 provides a breakdown of the responses by respondent group. As can be seen from this table, the tasks performed by at least 50% of POTENTIAL C-E USERS were Systems Comparison (59%), Life Cycle Cost Modeling/Forecasting (56%), Trade-Off Analysis (53%), Logistics Forecasting/Management (53%), and Reliability/Maintainability Studies (50%).

	RESPONDENT GROUP		
	ALL RESPONDENTS N=47	POTENTIAL C-E USERS N=32	C-E NONUSERS N=15
A. MY WORK DOES NOT INVOLVE C-E EQUIPMENT	13%	0%	40%
B. LIFE CYCLE COST MANAGEMENT	28%	41%	0%
C. TRADE-OFF ANALYSIS	36%	53%*	0%
D. BUDGET PREPARATION	32%	44%	7%
E. LIFE CYCLE COST MODELING/FORECASTING	38%	56%*	0%
F. RELIABILITY/MAIN- TAINABILITY STUDIES	43%	50%*	27%
G. LOGISTICS FORE- CASTING/MANAGEMENT	40%	53%*	13%
H. MANPOWER FORE- CASTING/MANAGEMENT	21%	28%	7%
I. SYSTEMS COMPARISON	45%	59%*	13%
J. DSARC SUBMISSIONS	6%	9%	0%
K. EVALUATE PRODUCT PERFORMANCE AGREEMENTS	30%	31%	27%
L. POM SUBMISSIONS	40%	44%	33%
M. OTHER	21%	22%	20%

\*Denotes those tasks performed by at least 50% of the respondents in a given group.

Table 2. Summary of Responses to Question 3.

Of the 47 respondents, 10 (21%) indicated that they performed other tasks involving C-E equipment. One respondent did not state what these tasks were. The remaining responses were:

POTENTIAL C-E USERS

- Computer Resource Life Cycle Management Plan and Technical (Engineering) Support.
- Resolve myriad of issues between wholesale (AF) supplier and retailer (AF) user of Ground C-E equipment.
- Assessment of C-E Equipment Availability, Reliability, and Sustainability.
- Software Support and Computer Resources Support.
- Evaluation of modification proposals.
- ILS/O&S Estimating.

C-E NONUSERS

- Technical Order Management and D056/B40 Data Management.
- My programs are Automated Test Equipment, so from that standpoint I occasionally get involved with testers that test communications equipment. That is as close as I get to C-E equipment.
- Plans and programs involving transition of Communications Electronics Technology to systems development, excluding FYDP and long (20 yrs.) range planning.

\*\*\*\*\*  
 \*  
 \*        Question 4. Do you now have (or do you anticipate in        \*  
 \*        the future) a need for O&S cost information on C-E        \*  
 \*        equipment?        \*  
 \*        \*        \*  
 \*        68% Yes        32% No (If no, please stop here and        \*  
 \*        return your questionnaire in        \*  
 \*        the enclosed envelope.)        \*  
 \*        \*        \*  
 \*\*\*\*\*

All respondents (N=47) were requested to answer this question, and there were no nonresponses. Of the 47 respondents, 32 (68%) answered "yes" and 15 (32%) answered "no." This question was used as a filter question to distinguish between POTENTIAL C-E USERS and C-E NONUSERS. A respondent who answered in the affirmative was requested to complete the remainder of the questionnaire, and was subsequently classified as a POTENTIAL C-E USER. A respondent who answered in the negative was requested to stop and return the already completed portion of the survey; he/she was subsequently classified as a C-E NONUSER.

```

*****
*
*      Question 5.  At what level(s) of detail do you (or will
*      you) require O&S cost information on C-E equipment?
*      Check all that apply.
*
*      75% End Item Level
*      72% Recoverable Component Level
*      9% Other (Please specify)
*
*****

```

Only POTENTIAL C-E USERS (N=32), i.e., those who responded affirmatively to Question 4, were requested to answer this question. There were no nonresponses to this question. Of the 32 respondents, 24 (75%) indicated that they require O&S cost information on C-E equipment at the End Item Level and 23 (72%) required this information at the Recoverable Component Level. Furthermore, 16 (50%) indicated a need for O&S cost information at both levels.

Three (9%) respondents indicated a requirement for information at other levels of detail. Their responses were:

- Computer Software Configuration Item (CSCI).
- In certain instances, I can see benefits from a capability to summarize data to the "L" System (e.g., 407L, 465L, etc.) Level. This need is in line with emphasis on Weapon Systems Management currently being expressed with USAF and DOD.
- Systems or Sub-system level.

```

*****
*
*      Question 6.  Where do you currently obtain your C-E
*      O&S cost information?
*
*      58% I do not currently have access to C-E
*      O&S cost information.
*      42% I obtain C-E O&S cost information from
*      (please specify):
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer this question. There was one nonresponse. Of the 31 responses, 18 (58%) indicated that they currently have no access to C-E O&S cost information. The remaining 13 (42%) indicated some access to C-E O&S cost information. Their responses regarding the sources of such information were:

- CFWO (Assessment Branch) and CFC (Program Management Division).
- VAMOSC (mentioned by two respondents).
- HQ AFCC/ACO.
- Rough estimates based on manufacturers data, projected reliability, maintenance support contract costs.
- Various sources including Defense Logistics Studies Information Exchange, AFR 173-13.
- To-date these type data, when absolutely required to accomplish assigned SM-ALC/MMC mission, are gathered from a variety of data systems and manual records.  
There is today a significant distrust of Maintenance Data Collection (MDC) that does exist, and there is a vast shortfall relative to C-E's equipment within the MDC systems. Therefore, our personnel routinely go to other, less accessible, more manpower intensive, but more accurate sources.
- Budget records.
- Operating Commands (SAC, TAC, etc.).
- Minimal Support from SM-ALC and AFCC.

- Special one-time studies.
- Functional experts.
- (AFR) 66-1.



```

*****
*
*   Question 7. Are you familiar with the Air Force
*   VAMOS C-E system?
*
*   6% I had never heard of the C-E system
*   prior to this survey.
*   63% I had heard of the C-E system prior to
*   this survey, but I had not seen any C-E
*   system output products.
*   25% I had heard of the C-E system and had
*   seen some C-E system output products prior
*   to this survey.
*   6% I had used the C-E system output products
*   prior to this survey.
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer this question, and there were no nonresponses. Of the 32 respondents, 30 (94%) had heard of or actually used the C-E system. Only 2 (6%) of the respondents were in this latter group. It may also be noted that 22 (69%) of the POTENTIAL C-E USERS had never seen any C-E system output products prior to this survey.

```

*****
*
*      Question 8. Please indicate the potential usefulness
*      of the C-E O&S Cost Report to you in your current
*      or future work.
*
*      19% Very Useful
*      44% Useful
*      28% Somewhat Useful
*      3% Not Useful
*      6% Don't Know
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer this question, and there were no nonresponses. Of the 32 respondents, 29 (91%) indicated that the C-E O&S Cost Report would be helpful in their current or future work. Only 1 (3%) respondent indicated that this report would not be useful, and 2 (6%) said they could not assess the potential usefulness of the Cost Report.

```

*****
*
*      Question 9.  Is the level of visibility within the major
*      cost groupings adequate for your current (or future) work,
*      or is more cost visibility required in some area(s)?
*
*      75% Visibility is Adequate
*      25% More Visibility Required
*      (Please indicate where it is required.)
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer this question, and there were no nonresponses. Of the 32 respondents, 8 (25%) indicated that more visibility was required within the major cost groupings. Their comments were:

- Does not consider software impact to support of processor driver hardware. Probably not within the scope of the model; However, it is a significant life-cycle cost factor.
- Attachment I says DSD D160A is to report & retain life-cycle O&S cost for C-E systems. A major portion of this life cycle cost, namely software & software support has been omitted. Focusing solely on hardware cost is misleading and obviously not the total O&S cost.
- Would need to know much more about the "equitable" allocation of costs to specific equipment. Are training costs included?
- In certain instances, I can see benefits from a capability to summarize data to the "L" System (e.g., 407L, 465L, etc.) Level. This need is in line with emphasis on Weapon Systems Management currently being expressed with USAF and DOD.
- LSC needs breakdown.
- Again - system or major sub system groupings.
- Operating systems in the field.

One respondent had fairly extensive comments which are given in Appendix C.

```

*****
*
*      Question 10a.  Could you use the information in the
*      O&S Cost Report without any supporting documentation
*      describing the cost categories on the report?
*
*      44% Yes
*      56% No
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer this question, and there were no nonresponses. Of the 32 respondents, 14 (44%) indicated that they could use the information in the O&S Cost Report without any supporting documentation describing the cost categories, while 18 (56%) indicated that they could not use the information without supporting documentation. Those respondents who answered negatively were requested to read Attachment 1, which provides an overview of the C-E system, and then to answer Question 10b. The other respondents were requested to continue with Question 11.

```

*****
*
*      Question 10b.  If your answer was "No," are the
*      descriptions of the cost categories provided in
*      Attachment 1 detailed enough for your needs?
*
*      56% Yes
*      44% No (Please indicate what needs to be
*           added to the descriptions.)
*
*****

```

Only respondents who answered "no" to Question 10a (N=18) were requested to answer Question 10b. There were no nonresponses. Of the 18 respondents, 10 (56%) answered that the descriptions in Attachment 1 were detailed enough, while 8 (44%) answered that the descriptions were not detailed enough. The comments of those latter respondents were:

- Need cost comparisons of similar equipment maintained by contract vs. blue-suit.
- Not Self Explanatory.
- Better.
- Need to know specifics, allocation methods, Degree of homogeneity of data for that group, what units were costed (P.1 of atch. 3 - 217 of 370 units were costed, were those w/wide, CONUS only? Are they representative).
- I would have concern about the allocation process/CERs used to allocate costs. Clearly systems differ to the amount of labor/materials required. Often the justification for a new system is to change one of these variables. Some access to the CERs is/would be necessary.
- The complete description of the figures: the data source, the algorithms, and the description of the cost element.
- Source of data. Procedure for validating data. How is invalid data handled? How much data is invalid? More detailed description, including sub-elements if appropriate.
- It should go down to the LRU, on demand.

```

*****
*
*      Question 11. Do you have any suggestions for additions,
*      deletions, or modifications on the O&S Cost Report that
*      you did not mention in Question #9? If so, please note
*      them here.
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer this question. Of the 32 respondents, 26 (81%) did not provide comments, while 6 (19%) provided comments. Their comments were:

- Need to be able to enter data base on more familiar nomenclature designators than the TMS, e.g., TRC-170 radio, Z-100 microcomputer, Northern Telecom DMS-150 switch, etc.
- Add: Acquisition and training costs to "Indirect Personnel." Replacement Support Equipment and Rep Spares Costs. Medical should be placed under "Installation Support" rather than "Indirect Personnel."
- Ensure implementation of category #8-Training.
- Spares costs are omitted, Training is hazy, fuel costs become rapidly outdated. Data bases used are suspect themselves even prior to allocation.
- List of items and categories of items contained in the database.

One survey had extensive comments which are given in Appendix C.

```

*****
*
*      Question 12. Using the scale below, please rate the
*      potential usefulness of the output products to you in your
*      current or future work, and note any suggestions or
*      comments you may have, identifying specific products by
*      letter. (Use back of page if more space is needed.)
*
*      _____ Very Useful
*      _____ Useful
*      _____ Somewhat Useful
*      _____ Not Useful
*      _____ Don't Know
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer this question after reading attachments 2 and 3, which provide descriptions and samples of C-E system output products. The number of nonresponses differed from output product to output product. However, there were no more than two nonresponses for any individual output product.

A mean response was computed by assigning weights of 0, 1, 2, and 3 for not useful, somewhat useful, useful, and very useful, respectively. Responses of "don't know" were excluded from calculation of the mean response.

The responses are summarized in Table 3. Inspection of this table reveals that all products, except for the Historical Cost Trend, received a mean rating which fell in between "somewhat useful" and "useful." The Historical Cost Trend product received a mean rating slightly above "useful." The products with the five highest mean ratings were:

Product	Number of Respondents	Response				Mean <sup>1</sup> Response
		Don't Know	Not Useful	Somewhat Useful	Very Useful	
A. Basic Inventory Data	32	3	2	8	13	1.79 (3)
B. Base Maintenance Material Cost	32	1	5	10	11	1.52 (13)
C. Base Maintenance Labor Cost	32	1	3	12	11	1.58 (12)
D. Annual Depot Maintenance Cost	32	1	2	12	12	1.65 (10)
E. Replacement Investment Cost	32	2	2	12	10	1.67 (7)
F. Packaging and Transportation Cost	32	2	4	15	7	1.37 (17)
G. Historical Annual LSC	32	3	1	12	7	1.83 (2)
H. Total (Fleet) O&S Cost	31	2	3	9	11	1.69 (5)
I. Total (Fleet) Cost	31	2	3	11	8	1.66 (9)
J. O&S Cost Per Item	31	2	3	7	15	1.69 (6)
K. LSC Per Item	31	2	3	7	13	1.76 (4)
L. % Change in Total O&S Cost	31	2	4	9	13	1.52 (14)
M. % Change in Total LSC	31	2	4	10	12	1.48 (15)
N. % Change in Per Item O&S Cost	31	1	3	14	10	1.43 (16)
O. % Change in Per Item LSC Cost	31	1	3	16	8	1.37 (18)
P. Ratio of O&S Cost/Price	31	4	3	10	7	1.67 (8)
Q. Ratio of LSC Cost/Price	31	3	4	10	7	1.61 (11)
R. Historical Cost Trend	30	3	0	8	10	2.04 (1)

<sup>1</sup>Mean response was computed by assigning weights of 0, 1, 2, and 3 for not useful, somewhat useful, useful, and very useful, respectively. Respondents who responded "don't know" were excluded. Ranks based on the mean response are given in parentheses.

Table 3. Summary of Responses to Question 12.



<u>Product</u>	<u>Mean Rating</u>
Historical Cost Trend	2.04
Historical Annual LSC	1.83
Basic Inventory Data	1.79
LSC Per Item	1.76
Total (Fleet) Cost	1.69

Several respondents made suggestions as to how some products could provide more useful information. Their comments were:

Product

a) Basic Inventory Data

- Add nomenclatures: TMS & NSN.
- Acquisition Price is helpful item here.
- NSN meaningless, TMS meaningless, Std. Reporting designators meaningless!

b) Base Maintenance Material Cost

- Don't understand this report.
- Meaningless without knowing what is included, Allocation Method, etc.

c) Base Maintenance Labor Cost

- Need to understand basis for "labor allocation factor."
- Meaningless without knowing what is included, Allocation Method, etc.
- Again. I don't have any warm fuzzies about the "Depot Level" type allocations going on. Usefulness of data for product substitutions/cost benefits seems limited.

d) Annual Depot Maintenance Cost

- NSN meaningless. Don't understand distinction between program cost and allocated depot maintenance cost.
- Meaningless without knowing what is included, Allocation Method, etc.
- Again. I don't have any warm fuzzies about the "Depot Level" type

allocations going on. Usefulness of data for product substitutions/cost benefits seems limited.

e) Replacement Investment Cost

- Spares costs, installation kits, Tech orders included?
- Don't understand derivation of Figures in "allocated replacement cost."

f) Packaging and Transportation Cost

- NSN meaningless, don't understand how figures are derived.
- Transportation costs from where to where? Better off taking weight and having local transportation office estimate.

g) Historical Annual LSC

- Figures seem distorted by large '82 expenditures on replacements.
- Again. I don't have any warm fuzzies about the "Depot Level" type allocations going on. Usefulness of data for product substitutions/cost benefits seems limited.
- Numbers on chart given make little logical sense. Replacement Investment cost ranges from \$6 to \$21,584. Base Maintenance Labor cost decreases one year. Trans & Packing Quadruples 81 to 82. Depot maintenance cost triples, Base Maint Material cost = 0.

h) Total (Fleet) O&S Cost

- If costs are relatively fixed, this ranking is totally dependent on # in inventory. No detail to verify this.

i) Total (Fleet) LSC

- If costs are relatively fixed, this ranking is totally dependent on # in inventory. No detail to verify this.

j) O&S Cost Per Item

- If costs are relatively fixed, this ranking is totally dependent on # in inventory. No detail to verify this.
- Need a sort by TMS sequence.

- Data included in 8206, Part 1.

k) LSC Per Item

- If costs are relatively fixed, this ranking is totally dependent on # in inventory. No detail to verify this.
- Need a sort by TMS sequence.
- Data included in 8206, Part 1.

l) % Change in Total O&S Cost

- If costs are relatively fixed, this ranking is totally dependent on # in inventory. No detail to verify this.

m) % Change in Total LSC

- If costs are relatively fixed, this ranking is totally dependent on # in inventory. No detail to verify this.

n) % Change in Per Item O&S Cost

- If costs are relatively fixed, this ranking is totally dependent on # in inventory. No detail to verify this.
- Need a sort by TMS sequence.

o) % Change in Per Item LSC Cost

- If costs are relatively fixed, this ranking is totally dependent on # in inventory. No detail to verify this.
- Need a sort by TMS sequence.

p) Ratio of O&S Cost/Price

- If costs are relatively fixed, this ranking is totally dependent on # in inventory. No detail to verify this.
- Need a sort by TMS sequence.

q) Ratio of LSC Cost/Price

- If costs are relatively fixed, this ranking is totally dependent on # in inventory. No detail to verify this.
- Need a sort by TMS sequence.

r) Historical Cost Trend

- Explain!
- Would be useful if costs given have credence.

Some general comments were:

- Significance of asterisked items is not explained.
- Ranking reports of no value. Large year-to-year variations in ranking make basic data and/or calculation methods suspect.
- Ranking reports should all be in either whole dollars or thousands.  
"Hundreds of dollars is difficult to work with & could inject errors.

One survey had extensive comments which are given in Appendix C.

```

*****
*
*      Question 13. Overall, given the variety and content of
*      the standard output products, how useful would the C-E
*      system be in your current or future work?
*
*      13% Very Useful
*      56% Useful
*      19% Somewhat Useful
*      9% Not Useful
*      3% Don't Know
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer this question. There were no nonresponses. Of the 32 respondents, 28 (88%) indicated that the C-E system would be helpful in their current or future work. Of these 4 (13%) respondents indicated that this system would be very useful in their work. Only 3 (9%) indicated that the C-E system would not be useful.

```

*****
*
*   Question 14.  The C-E system is currently a batch system
*   which provides its output products on microfiche and
*   paper, and in some instances on magnetic tape.  Do you
*   think the potential usefulness of the C-E system would be
*   increased if the O&S cost information were available
*   on-line?
*
*   68% Yes      32% No
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer this question. There was one nonresponse. Of the 31 respondents, 21 (68%) said that the potential usefulness of the C-E system would be increased if the O&S cost information were available on-line, while 10 (32%) said that on-line availability would not increase the potential usefulness of the C-E system.

```

*****
*
*      Question 15.  Have you seen a briefing or
*      demonstration of COSTCASTER?
*
*      9% Yes      91% No
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer this question, and there were no nonresponses. Of the 32 respondents, only 3 (9%) indicated that they had seen a briefing or demonstration of COSTCASTER.

```

*****
*
*      Question 16. Please indicate the potential usefulness
*      of COSTCASTER to you in your current or future work.
*
*      16% Very Useful
*      39% Useful
*      16% Somewhat Useful
*      13% Not Useful
*      16% Don't Know
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer this question after reading Attachment 4, which provided a description of the COSTCASTER model. There was one nonresponse. Of the 31 respondents, 22 (71%) indicated that COSTCASTER would be helpful in their current or future work. Of these 5 (16%) respondents indicated that COSTCASTER would be very useful in their work. Only 4 (13%) indicated that COSTCASTER would not be useful.



```

*****
*
*      Question 17.  If you have any additional comments on any
*      topic in this questionnaire, please note them here.
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer this question. Of the 32 respondents, 7 (22%) provided additional comments. Their comments were:

- Referring to Question 13: Slightly off target for my work, which is engineering overview of programs and systems support.  
Referring to Question 14: If the data is updated frequently.
- Would like to obtain a description of the COSTCASTER model.
- I don't feel you can make intelligent management decision with a significant portion of O&S data missing (e.g., software).
- To be useful, I think an expert on VAMOSC would need to interface with user, to translate his questions into a form or report producible by VAMOSC, and to caveat results.
- I encourage you to make VAMOSC a better system.
- VAMOSC USES:
  1. Questionable allocation methods.
  2. Questionable data bases.
  3. Omits spares, installation kits, associated minor construction, documentation.
- What is the C-E population? Does it include ATE?

```

*****
*
*      Question 18a.  Would you like further information
*      about the C-E system?
*
*      65% Yes      35% No
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer Question 18a. There was one nonresponse to this question. Of the 31 respondents, 20 (65%) indicated they would like further information about the C-E system. Respondents who answered "yes" to this question were requested to provide their name and address. However, not all of them did so. Desmatics provided the Office of VAMOSC with a list of those respondents for which this information was available.

```

*****
*
*      Question 18b.  Would you like further information
*      about COSTCASTER?
*
*      69% Yes      31% No
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer Question 18b. There were no nonresponses to this question. Of the 32 respondents, 22 (69%) indicated that they would like further information about COSTCASTER. Respondents who answered "yes" to this question were requested to provide their name and address. However, not all of them did so. Desmatics provided the Office of VAMOSC with a list of those respondents for which this information was available.

```

*****
*
*      Question 18c.  May we contact you by phone with more
*      detailed questions or for explanations or clarifications
*      concerning your responses?
*
*      87% Yes      13% No
*
*****

```

POTENTIAL C-E USERS (N=32) were requested to answer Question 18c. There were two nonresponses to this question. Of the 30 respondents, 26 (87%) indicated that they were willing to be contacted for follow-up. However, it was not necessary for Desmatics to make any additional contacts with the respondents.

## V. SUMMARY AND CONCLUSIONS

If the C-E system were truly a production system, there is little doubt that it would prove helpful in performing tasks which require O&S cost information on C-E equipment. Of the potential users identified by this survey, 88% thought that the C-E system would be helpful in their work (13% believed the system would be very useful, 56% believed it would be useful, and 19% believed it would be somewhat useful). In addition, 68% believed that the usefulness of the C-E system would be increased if its information were available on-line. Furthermore, 71% thought that the COSTCASTER model would be helpful.

The ratings of the system output products, in terms of usefulness, were also positive. The Historical Cost Trend report was rated the most useful of the output products, followed by the Historical Annual LSC report. Thus, major interest appears to be in having O&S cost data portrayed for a period of years. Based on this observation, it is reasonable to assume that the relatively high assessment of the usefulness of the COSTCASTER model was due, in part, to the fact that it is designed to provide such data both in tabular and graphical form. The interest in having data portrayed over a number of years is not surprising in view of the fact that the tasks performed by at least 50% of the potential users (systems comparison, life cycle cost modeling/forecasting, trade-off analysis, logistics forecasting/management, reliability/maintainability) tend to require such information.

A need was expressed for supporting documentation describing the cost categories on the O&S Cost Report. This emphasizes the need for C-E system users to be familiar with the user's manual or for cost category descriptions

to be given on the cost report itself.

In general, respondents said that the level of visibility within the major cost groupings was adequate for their work. Further, a need for O&S cost information was indicated at both the end item and recoverable component levels. Although nearly 60% of the potential users indicated that they do not currently have access to C-E O&S cost information, only 6% said that they had never heard of the Air Force C-E system. Thus, a large portion of potential users, although aware of the C-E system, did not attempt to utilize a system they judged to be helpful.

It must be stressed, however, that in order for the C-E system to be helpful in practice, as well as in theory, it must produce output products which provide accurate and complete cost information. Unfortunately, the system was placed in operation while it still contained significant defects. Although corrections to a number of those defects have been specified, they do not include the most significant ones. These involve deficient depot and base-level maintenance input data. The Office of VAMOSC has decided, therefore, to suspend operation of the C-E system. Thus, the survey results are currently moot. However, should the decision be reversed in the future, the information obtained through this survey should prove of value to the Office of VAMOSC in assessing the usefulness of the C-E system products and possible modifications that should be made to those products.

APPENDIX A: INITIAL LETTER AND ATTACHMENT



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS UNITED STATES AIR FORCE  
WASHINGTON, D.C. 20330-5130

REPLY TO  
ATTN OF:

LEYE

28 August 1986

SUBJECT:

GROUND COMMUNICATIONS-ELECTRONICS (C-E) SYSTEM

TO:

See Distribution List

1. The Ground Communications-Electronics (C-E) System, D160A, tracks Operating and Support costs for Air Force ground communications-electronics and meteorological equipment. A brief overview of the C-E system is attached.
2. HQ AFLC/MML has tasked Desmatics, Inc. to identify potential users of the C-E system and to collect their opinions on the content and form of system products. This information is essential if the system is to provide high quality pertinent information to its users.
3. Your help in identifying potential users of C-E system information would be greatly appreciated. If you know of any office (including yours) who are currently using O&S cost data for Air Force C-E equipment, or who may have need for such data, please provide their names and addresses below. Return this form in the enclosed envelope as soon as possible so that we may contact those you have indicated. Questions may be directed to Lt Ricky Burden, AFLC/MML (VAMOSC), AUTOVON 787-4963.

*[Signature]*  
W.S. CARTER  
Deputy, Acquisition Logistics &  
Communications Group  
Dir, Maintenance & Supply

- 2 Atch  
1. Distribution List  
2. C-E Systems

Name

Mailing Address

Phone Number



An Overview of the Ground  
Communications-Electronics (C-E) System

The Ground Communications-Electronics (C-E) system (DSD D160A) is a component of the Air Force Visibility and Management of Operating and Support Costs (VAMOSC) system. The purpose of the C-E system is to report operating and support costs of ground C-E equipment at the Type Model Series (TMS) level. The C-E system obtains the majority of its input data from other Air Force systems which provide cost, manpower, and maintenance information.

Because cost data is generally not available at the TMS level, the C-E system allocates shares of common costs to each TMS on an equitable basis by means of several algorithms appropriate to the type of data available.

The C-E system is designed to provide operating and support costs in the following categories:

1. Operations Personnel (not currently implemented)
2. Base Maintenance Personnel
3. Administrative Personnel
4. Supply Support Personnel
5. Fuel (not currently implemented)
6. Maintenance Material
7. Utilities
8. Depot Maintenance
9. Replacement Investment
10. Base Operations Support
11. Real Property Maintenance
12. Communications
13. Temporary Duty
14. Permanent Change of Station
15. Medical
16. General Depot Support
17. Transportation and Packaging
18. Engineering Support
19. Advanced Training (not currently implemented)

Further information about the C-E system may be obtained by contacting the C-E Action Officer, Lt Ricky Burden, HQ AFLC/MML(VAMOSC), AV 787-4963.

APPENDIX B: SURVEY AND ATTACHEMENTS

THE AIR FORCE GROUND COMMUNICATIONS-ELECTRONICS (C-E) SYSTEM:

A SURVEY OF USER REQUIREMENTS

The Ground Communications-Electronics (C-E) system is a component of the Air Force Visibility and Management of Operating and Support Costs (VAMOSC) system. The C-E system is designed to provide operating and support (O&S) cost information on ground communications-electronics and meteorological equipment at the Type Model Series (TMS) level.

The Air Force Office of VAMOSC, HQ AFLC/ACCV, has tasked Desmatics, Inc. to develop the attached questionnaire to obtain comments and suggestions from potential users of the C-E system. This information will be used to modify or develop system output products to meet user requirements.

The Office of VAMOSC and Desmatics would greatly appreciate receiving your response to this questionnaire. To complete it, you will need to refer to the four attachments provided. These attachments are:

1. An Overview of the C-E System
2. A Description of C-E System Output Products
3. Samples of C-E System Standard Products
4. A Description of the COSTCASTER model

When you have completed this questionnaire, please return it in the envelope provided to:

Desmatics, Inc.  
P.O. Box 618  
State College, PA 16804

1. Name \_\_\_\_\_ } Optional  
Address \_\_\_\_\_ }  
Commercial Phone No. \_\_\_\_\_ }

2. Who is your current employer?

☐ Air Force                      ☐ Dept. of Defense  
☐ Army                            ☐ Dept. of Defense contractor  
☐ Navy                            ☐ Other, please specify:

3. Which of the following tasks involving C-E equipment do you perform in your work? Please check all that apply.

☐ My work does not involve C-E equipment  
☐ Life cycle cost management  
☐ Trade-off analysis  
☐ Budget preparation  
☐ Life cycle cost modeling/forecasting  
☐ Reliability/maintainability studies  
☐ Logistics forecasting/management  
☐ Manpower forecasting/management  
☐ Systems comparison (existing or conceptual)  
☐ DSARC submissions  
☐ Evaluate product performance agreements (warranties, maintenance agreements, etc.)  
☐ POM submissions  
☐ Other(s), please specify:

4. Do you now have (or do you anticipate in the future) a need for O&S cost information on C-E equipment?

☐ Yes                      ☐ No (If no, please stop here and return your questionnaire in the enclosed envelope.)

5. At what level(s) of detail do you (or will you) require O&S cost information on C-E equipment? Check all that apply.

☐ End Item Level  
☐ Recoverable Component Level  
☐ Other (Please specify)

6. Where do you currently obtain your C-E O&S cost information?

☐ I do not currently have access to C-E O&S cost information.  
☐ I obtain C-E O&S cost information from (please specify):

7. Are you familiar with the Air Force VAMOSC C-E system?

☐ I had never heard of the C-E system prior to this survey.  
☐ I had heard of the C-E system prior to this survey, but I had not seen any C-E system output products.  
☐ I had heard of the C-E system and had seen some C-E system output products prior to this survey.  
☐ I had used the C-E system output products prior to this survey.

Before continuing with Question 8, please review Attachment 1 (which provides an overview of the C-E system and its cost categories) and the first page of Attachments 2 and 3 (which provide a description and example of the C-E O&S Cost Report, the principal standard product of the C-E system).

8. Please indicate the potential usefulness of the C-E O&S Cost Report to you in your current or future work.

☐ Very Useful  
☐ Useful  
☐ Somewhat Useful  
☐ Not Useful  
☐ Don't Know

9. Is the level of visibility within the major cost groupings adequate for your current (or future) work, or is more cost visibility required in some area(s)?

☐ Visibility is Adequate  
☐ More Visibility Required (Please indicate where it is required.)

10. (a) Could you use the information in the O&S Cost Report without any supporting documentation describing the cost categories on the report?

☐ Yes  
☐ No

- (b) If your answer was "No," are the descriptions of the cost categories provided in Attachment 1 detailed enough for your needs?

☐ Yes  
☐ No (Please indicate what needs to be added to the descriptions.)

11. Do you have any suggestions for additions, deletions, or modifications on the O&S Cost Report that you did not mention in Question #9? If so, please note them here.

Before continuing with Question 12, please review the remaining pages of Attachments 2 and 3, which describe and give samples of the other C-E system standard products.

12. Using the scale below, please rate the potential usefulness of the output products to you in your current or future work, and note any suggestions or comments you may have, identifying specific products by letter. (Use back of page if more space is needed.)

- 1 Very Useful
- 2 Useful
- 3 Somewhat Useful
- 4 Not Useful
- 5 Don't Know

LOGISTIC SUPPORT COST REPORTS:

<u>Product</u>	<u>Rating</u>	<u>Suggestions and/or Comments</u>
(a) Basic Inventory Data (Attachment 3, page 2)	—	
(b) Base Maintenance Material Cost (Attachment 3, page 2)	—	
(c) Base Maintenance Labor Cost (Attachment 3, page 3)	—	
(d) Annual Depot Maintenance Cost (Attachment 3, page 3)	—	
(e) Replacement Investment Cost (Attachment 3, page 4)	—	
(f) Packaging and Transportation Cost (Attachment 3, page 4)	—	
(g) Historical Annual LSC (Attachment 3, page 5)	—	

12. (Continued)

- 1 Very Useful
- 2 Useful
- 3 Somewhat Useful
- 4 Not Useful
- 5 Don't Know

RANKING REPORTS AND HISTORICAL COST TREND REPORT:

<u>Product</u>	<u>Rating</u>	<u>Suggestions and/or Comments</u>
(h) Total (Fleet) O&S Cost (Attachment 3, page 6)	—	
(i) Total (Fleet) LSC (Attachment 3, page 7)	—	
(j) O&S Cost Per Item (Attachment 3, page 8)	—	
(k) LSC Per Item (Attachment 3, page 9)	—	
(l) % Change in Total O&S Cost (Attachment 3, page 10)	—	
(m) % Change in Total LSC (Attachment 3, page 11)	—	
(n) % Change in Per Item O&S Cost (Attachment 3, page 12)	—	
(o) % Change in Per Item LSC Cost (Attachment 3, page 13)	—	
(p) Ratio of O&S Cost/Price (Attachment 3, page 14)	—	
(q) Ratio of LSC Cost/Price (Attachment 3, page 15)	—	
(r) Historical Cost Trend (Attachment 3, page 16)	—	



13. Overall, given the variety and content of the standard output products, how useful would the C-E system be in your current or future work?

☐ Very Usefu.  
☐ Useful  
☐ Somewhat Useful  
☐ Not Useful  
☐ Don't Know

14. The C-E system is currently a batch system which provides its output products on microfiche and paper, and in some instances on magnetic tape. Do you think the potential usefulness of the C-E system would be increased if the O&S cost information were available on-line?

☐ Yes ☐ No

Before continuing with Question 15, please review Attachment 4, which describes COSTCASTER, a cost-prediction and trade-off model for Air Force ground C-E equipment.

15. Have you seen a briefing or demonstration of COSTCASTER?

☐ Yes ☐ No

16. Please indicate the potential usefulness of COSTCASTER to you in your current or future work.

☐ Very Useful  
☐ Useful  
☐ Somewhat Useful  
☐ Not Useful  
☐ Don't Know

17. If you have any additional comments on any topic in this questionnaire, please note them here.

18. (a) Would you like further information about the C-E system?

☐ Yes ☐ No

(b) Would you like further information about COSTCASTER?

☐ Yes ☐ No

(c) May we contact you by phone with more detailed questions or for explanations or clarifications concerning your responses?

☐ Yes ☐ No

If you answered any of Questions 18 (a), (b), or (c) "yes," please make sure you have completed Question 1.

Thank you for completing this questionnaire. Please return it in the envelope provided to:

Desmatics, Inc.  
P.O. Box 618  
State College, PA 16804

## ATTACHMENT 1

### Overview of the Ground Communications-Electronics (C-E) System

The Ground Communications-Electronics (C-E) system (DSD D160A) is a component of the Air Force Visibility and Management of Operating and Support Costs (VAMOSC) system. The purpose of the C-E system is to report and retain over their respective life cycles, the annual operating and support costs of ground communications-electronics and meteorological equipment. Costs are reported at the Type Model Series (TMS) level.

The C-E system obtains the majority of its input data from other Air Force systems which provide cost, manpower, and maintenance information. Because cost data is generally not available at the TMS level, the C-E system allocates shares of common costs to each TMS on an equitable basis by means of several algorithms appropriate to the type of data available. The system is designed to provide operating and support costs in nineteen categories grouped as follows:

1. Unit Mission Personnel
  - Operations Personnel (not currently implemented)
  - Base Maintenance Personnel
  - Administrative Personnel
  - Supply Support Personnel
2. Unit Level Consumption
  - Fuel (not currently implemented)
  - Maintenance Material
  - Utilities
3. Depot Maintenance
4. Replacement Investment
5. Installation Support
  - Base Operations Support
  - Real Property Maintenance
  - Communications

6. Indirect Personnel
  - Temporary Duty
  - Permanent Change of Station
  - Medical
7. Depot Non-Maintenance
  - General Depot Support
  - Transportation and Packaging
  - Engineering Support
8. Advanced Training (not currently implemented)

The content of each of these categories is briefly defined below.

#### 1. Unit Mission Personnel

These costs are the allocated pay and allowances (retirement, leave, holiday, etc.) of the four types of C-E mission personnel listed below together with their duties:

Operations Personnel: operate C-E equipment.

Base Maintenance Personnel : perform base-level maintenance on C-E equipment.

Administrative Personnel: provide administrative support for the C-E unit.

Supply Support Personnel: provide a liaison between the C-E base maintenance organization and base supply.

#### 2. Unit Level Consumption

Fuel: the allocated cost of fuel for each TMS which requires fuel for operation (e.g. TMSs powered by fuel-consuming generators).

Maintenance Material: the cost of consumable maintenance material for base-level maintenance for a TMS.

Utilities: the allocated cost of centrally produced or purchased electricity for operation of a TMS.

### 3. Depot Maintenance

Depot Maintenance: the allocated costs of depot-level maintenance or modification of TMSs and their recoverable components at centralized DoD repair depots and contractor repair facilities, or on site with mobile depot maintenance teams.

### 4. Replacement Investment

Replacement Investment: the allocated cost of reparable spares to replace recoverable components which are beyond economical repair.

### 5. Installation Support

Base Operating Support (BOS): the allocated cost of various services (such as installation administration, comptroller activities, food services, and recreational activities) provided to C-E unit mission personnel.

Real Property Maintenance (RPM): the allocated cost of maintaining and operating real property facilities.

Communications (COM): the allocated cost of base communications services.

#### 6. Indirect Personnel Costs

Temporary Duty (TDY): the allocated cost of moving C-E mission personnel to and from temporary duty stations for periods not to exceed eighty nine days.

Permanent Change of Station (PCS): the allocated cost of moving military C-E mission personnel to permanent duty locations.

Medical: the allocated cost of medical and dental care for military C-E mission personnel and their dependents.

#### 7. Depot Non-Maintenance

General Depot Support (GDS): the allocated cost of functions which support depot maintenance activities. These functions include supply operations, inventory control point operations, and central procurement agencies.

Engineering Support: the allocated cost of depot-level contracted service engineering for safe system operation.

Transportation and Packaging (T&P): the allocated cost of packing and shipping a TMS or any of its components to a depot for repair, and back to the user. Also included is the cost of shipping replacement parts from supply points to users.

## 8. Advanced Training

Advanced Training: the cost for specialized training over and above basic training, usually on specific C-E end items.

## ATTACHMENT 2

### C-E System Output Products

The C-E system produces a number of standard products annually. The principal standard product is the C-E O&S Cost Report. There are, in addition, seven logistic support cost reports and ten ranking reports. Finally, there is a report containing a historical listing of rankings by TMS. Costs are reported in then year dollars in all cases. Reports are available on paper or microfiche, with history file data also available on magnetic tape. Also available to users on request is a set of Demand Products. This is a set of 24 tables and intermediate data base files containing the detailed information used to build the standard products. These are available either on microfiche or magnetic tape.

The standard output products, together with a brief description of the data they contain, are listed in the following subsections. A sample of each of these products is in Attachment 3.

#### 1. C-E Operating and Support (O&S) Cost Report

A sample C-E O&S Cost Report is on page 1 of Attachment 3. One such report is produced for each TMS costed by the C-E system. The five cost categories marked by a double asterisk, Base Maintenance Personnel, Maintenance Material, Depot Maintenance, Replacement Investment, and Transportation and Packaging are collectively known as Logistics Support Costs (LSC).



## 2. C-E Logistic Support Cost Reports

There are seven Logistic Support Cost reports for each TMS costed by the C-E system. These products are listed below, and samples are shown on pages 2-5 in Attachment 3.

- Page 2: C-E Basic Inventory Data Report  
C-E Base Maintenance Material Cost Report
- Page 3: C-E Base Maintenance Labor Cost Report  
C-E Annual Depot Maintenance Cost Report
- Page 4: C-E Replacement Investment Cost Report  
C-E Packaging and Transportation Cost Report
- Page 5: C-E Historical Annual LSC Report

## 3. C-E Ranking Reports

There are ten individual C-E Ranking Reports. Samples are on pages 6-15 in Attachment 3. Rankings are based on the following data:

- Page 6: Total O&S cost
- Page 7: Total LSC
- Page 8: O&S cost per item
- Page 9: LSC per item
- Page 10: Percentage change in O&S cost from the previous year
- Page 11: Percentage change in LSC from the previous year
- Page 12: Percentage change in per item O&S cost from the previous year
- Page 13: Percentage change in per item LSC from the previous year
- Page 14: Ratio of O&S cost per item/Acquisition price
- Page 15: Ratio of LSC per item/Acquisition price

## 4. The C-E Historical Cost Trend Report

This report, shown on page 16 of Attachment 3, contains the consolidated ranking information for O&S cost and LSC over a ten-year period. One such report is produced for each TMS costed by the C-E system.

ATTACHMENT 3

C-E System Standard Products

Sample Reports

# COMMUNICATIONS-ELECTRONICS

MML(VAMOSC) OPERATING AND SUPPORT DATE 10-15-84 PAGE 237  
 HAF-LEY(A)8117 COST REPORT AS OF: 09-30-84

TMS GSHO35  
 NOMENCLATURE RECORDER-REPRODUCER 370  
 WORLDWIDE INVENTORY

SRD FY 84  
 COSTED INVENTORY 217

DETAIL COST CATEGORY SUBTOTAL TMS TOTAL

1,868,083

UNIT MISSION PERSONNEL  
 OPERATIONS PERSONNEL  
 \* \* BASE MAINTENANCE PERSONNEL  
 UNIT ADMINISTRATIVE PERSONNEL  
 SUPPLY SUPPORT PERSONNEL

954,421  
 830,958  
 80,704

UNIT LEVEL CONSUMPTION  
 FUEL  
 \* \* MAINTENANCE MATERIAL  
 ELECTRIC UTILITIES

58,424  
 241  
 58,183

\* \* DEPOT MAINTENANCE COST  
 \* \* REPLACEMENT INVESTMENT

258,185  
 3,284

INSTALLATION SUPPORT  
 BASE OPERATING SUPPORT  
 REAL PROPERTY MAINTENANCE  
 COMMUNICATIONS

701,941  
 127,538  
 74,504

INDIRECT PERSONNEL COST  
 TEMPORARY DUTY (TDY) COST  
 PERMANENT CHANGE OF STATION  
 MEDICAL (HEALTH CARE)

241,992

DEPOT NON-MAINTENANCE  
 GENERAL DEPOT SUPPORT  
 ENGINEERING SUPPORT  
 \* \* TRANSPORTATION AND PACKAGING

35,903  
 142,064  
 64,025  
 111,071  
 0  
 67,439

178,510

ADVANCED TRAINING

\* 0

OPERATING AND SUPPORT COST - TMS GSHO35

3,510,441

C-E O&S COST REPORT

\*Not currently computed  
 \*\*LSC

# • ECR • COMMUNICATIONS - ELECTRONICS

HML/AMOSC

BASIC INVENTORY DATA DATE 07/28/86 Q-D160A-03A-DM-MD3 PAGE 1  
AS OF: 09-30-86

RCS MAF-LEV(AR)B110

TMS: GSH035 / FY: 84  
STANDARD REPORTING DESIGNATORS: JWF

NSN	ACQUISITION PRICE	INVENTORY				AVG ANM	CONDEMNATIONS				TOTAL
		QTR 1	QTR 2	QTR 3	QTR 4		QTR 1	QTR 2	QTR 3	QTR 4	
25015002613005	\$ 4,400	000004	000004	000004	000004	4.00	0000	0001	0001	0000	0
25015004562416	\$ 5,393	000373	000365	000363	000362	365.75	0000	0001	0001	0000	2

-----369.75

-----2

## C-E BASIC INVENTORY DATA REPORT

# • JCB • COMMUNICATIONS - ELECTRONICS

HML/AMOSC

BASE MAINTENANCE MATERIAL COST DATE 07/28/86 Q-D160A-03F-DM-MD3 PAGE 1  
AS OF: 09-30-86

RCS MAF-LEV(AR)B123

TMS: GSH035

FY	BASE MAINTENANCE MATERIAL COST	AVERAGE ANNUAL INVENTORY	NORMALIZED	
			BASE MAINTENANCE	MATERIAL COST
84	\$ 241	369.75	\$ 8	0

## C-E BASE MAINTENANCE MATERIAL COST REPORT

# COMMUNICATIONS - ELECTRONICS

\* JOB\*  
 PHL/AMCSC  
 RCS MAP-LET(AR)125  
 BASE MAINTENANCE LABOR COST  
 DATE 07/28/86  
 Q-0160A-03E-DM-MD3  
 AS OF: 09-30-84  
 TMS: GS4035  
 AFSC:

FY	CORRECTIVE	MANHOURS	SUPPORT GENERAL	TOTAL ANNUAL DIRECT MANHOURS	TOTAL ANNUAL DIRECT MANHOURS / AFSC	BASE LABOR ALLOCATION FACTOR	TOTAL AFSC LABOR COST	BASE LABOR COST	AVERAGE ANNUAL INVENTORY	NORMALIZED BASE LABOR COST
84	15429.1	70252.5		85881.6	5102768.1	.016	\$56,708,193	\$ 954,421	369.75	\$ 2,581
TOTAL \$-----\$567										

## C-E BASE MAINTENANCE LABOR COST REPORT

# COMMUNICATIONS - ELECTRONICS

\* JOB\*  
 PHL/AMCSC  
 RCS MAP-LET(AR)120  
 ANNUAL DEPOT MAINTENANCE COSTS  
 DATE 07/28/86  
 Q-0160A-03E-DM-MD3  
 AS OF: 09-30-84  
 TMS: GS4035 / FY: 84

MSN	DEPOT MAINTENANCE QUANTITY	PROGRAM COST	RECOVERABLE ALLOCATION FACTOR	ALLOCATED DEPOT MAINTENANCE COSTS	AVERAGE ANNUAL INVENTORY	NORMALIZED ALLOCATED COSTS
583507613805	0	\$ 0	1.000	\$ 0	369.75	\$ 0
583507613805	40	\$ 254,208	1.000	\$ 254,208	369.75	\$ 687
583507613805	0	\$ 0	1.000	\$ 0	369.75	\$ 0
583507613805	0	\$ 0	1.000	\$ 0	369.75	\$ 0
583507613805	5	\$ 3,977	1.000	\$ 3,977	369.75	\$ 10
TOTAL \$-----\$697						

## C-E ANNUAL DEPOT MAINTENANCE COST REPORT

\* GDB\*

# COMMUNICATIONS - ELECTRONICS

MHL/VAMOSC

RCS HAF-LEY (AR) 8121

REPLACEMENT INVESTMENT COSTS

DATE 07/28/86

Q-D160A-03C-DP-M03

PAGE 1

TMS: GSH035 / FY: 84

AS OF: 09-30-84

NSM	DEPOT MAINT QUANTITY	DEPOT CONDEMN QTY	BASE CONDEMN QTY	UNIT REPLACEMENT COST	RECOV ALLOF FACTOR	ALLOCATED REPLACEMENT COST	AVERAGE ANNUAL INVENTORY	NORMALIZED ALLOCATED REPLACEMENT INVESTMENT COST
*5835007613005	0	0	0	\$ 4,400	1.000	\$ 0	369.75	\$ 0
*5835008562436	40	0	0	\$ 5,393	1.000	\$ 0	369.75	\$ 0
5835009541190	0	0	15	\$ 64	1.000	\$ 1,472	369.75	\$ 3
5835009542833	0	13	15	\$ 64	1.000	\$ 1,792	369.75	\$ 4
5835010774160	5	0	0	\$ 383	1.000	\$ 0	369.75	\$ 0

TOTAL \$-----7

## G-E REPLACEMENT INVESTMENT COST REPORT

\* HLB\*

# COMMUNICATIONS - ELECTRONICS

MHL/VAMOSC

RCS HAF-LEY (AR) 8124

PACKAGING AND TRANSPORTATION COSTS

DATE 07/28/86

Q-D160A-03D-DH-M03

PAGE 1

TMS: GSH035 / FY: 84

AS OF: 09-30-84

NSM	PACKAGED WEIGHT (LBS)	ONE-WAY QUANTITY	ROUND TRIP QUANTITY	ONE-WAY PACKAGING AND TRANSPORT COSTS	ROUND TRIP PACKAGING AND TRANSPORT COSTS	RECOV A LOC FACTOR	ALLOCATED PKG AND TRANS COST	AVERAGE ANNUAL INVENTORY	NORMALIZED ALLOCATED PKG AND TRANS COST
5835007613005	749	0	0	\$ 0	\$ 0	1.000	\$ 0	369.75	\$ 0
5835008562436	565	0	40.0	\$ 0	\$ 66,991	1.000	\$ 66,991	369.75	\$ 181
5835009541190	1	15	0.0	\$ 22	\$ 24	1.000	\$ 46	369.75	\$ 0
5835009542833	1	15	13.0	\$ 22	\$ 39	1.000	\$ 61	369.75	\$ 0
5835010774160	23	0	5.0	\$ 0	\$ 341	1.000	\$ 341	369.75	\$ 0

TOTAL \$-----181

## G-E PACKAGING AND TRANSPORTATION COST REPORT

# COMMUNICATIONS - ELECTRONICS

PAGE 1

Q-D160A-D3G-DM-MD3

DATE 07/28/86

HISTORICAL ANNUAL LOGISTIC SUPPORT COST

AS OF: 09-30-84

TMS: GSH035

RCS WAF-LEYCARJ8122

WML/VAMOSC

FY	DEPT MAINT COST	% OF TOTAL COST	REPLACEMENT INVESTMENT COST	% OF TOTAL COST	TRANSPOR- TATION & PACKAGING COST	% OF TOTAL COST	BASE MAINT LABOR COST	% OF TOTAL COST	BASE MAINT MATERIAL COST	% OF TOTAL COST	TOTAL LOGISTIC SUPPORT COST	AVERAGE ANNUAL INVENTORY
81	\$ 203	11	\$ 60	3	\$ 26	1	\$ 1,433	83	\$ 0	0	\$ 1,722	359.00
82	\$ 218	10	\$ 21,586	90	\$ 123	0	\$ 1,912	8	\$ 0	0	\$ 23,838	359.00
83	\$ 366	15	\$ 7	0	\$ 167	6	\$ 1,896	77	\$ 0	0	\$ 2,434	368.00
84	\$ 698	20	\$ 0	0	\$ 182	5	\$ 2,581	74	\$ 0	0	\$ 3,469	369.75

C-E HISTORICAL ANNUAL LSC REPORT

# COMMUNICATIONS - ELECTRONICS

PAGE 2

86-07-25 0-0160A-RSX-PK-MRS

RANKING BY OPERATING & SUPPORT COST

COSTS EXPRESSED IN HUNDREDS OF DOLLARS

AS OF 09-30

RCS: HAF-LEY(A)8208

MAIL/VAMOSC

RANK THIS YEAR	TMS	WORLDWIDE AVERAGE ANNUAL INVENTORY	O & S COST	RANK LAST YEAR	< > < > < >	RANK THIS YEAR	TMS	WORLDWIDE AVERAGE ANNUAL INVENTORY	O & S COST	RANK LAST YEAR
81	TSC60V4	8.25	16060	140	<	121	FCC022	33.75	9385	111
82	PRC077	1095.25	15813	101	<	122	001 7411	11.50	9281	170
83	OY0060M	7.50	15580	226	<	123	FCC058V	36.50	9286	142
84	MO28ASR	577.75	15397	37	<	124	FY0026	43.00	9207	129
85	FCC032V	32.75	15239	100	<	125	T5093V3	4.00	9007	199
86	MRC108	224.75	15200	114	<	126	GRN028	59.50	8860	47
87	TA312PT	8017.50	14958	29	<	127	DL245QYC	11.50	8625	178
88	GSM012	7.75	14761	168	<	128	TT0022	19.00	8646	102
89	MODEL40	110.75	14429	77	<	129	TYCO08V	25.00	8641	143
90	GVO039V1	3.00	14405	785	<	130	FRC075	4.50	8457	194
91	FSC082	22.00	14348	122	<	131	UY0014V	4.00	8308	40
92	FX0004	250.25	13958	192	<	132	R165SURR	97.75	8124	156
93	GSO080	17.00	13796	127	<	133	GRA081	276.75	7988	13
94	DK0205Q	7.25	13681	76	<	134	GSCO38V2	20.00	7960	622
95	GKAO05	17.00	13485	185	<	135	TSM109	17.75	7804	146
96	TSC102	7.25	13364	133	<	136	UY0013V	4.00	7750	162
97	SMO398Q	43.25	12833	180	<	137	T50096	2.00	7271	79
98	GSH034	57.25	12678	95	<	138	T50061	25.00	7252	214
99	FY0059	59.50	12511	106	<	139	GOCO37V	38.25	7087	56
100	GSO076	673.25	12367	63	<	140	UPX006	285.25	6966	551
101	CM0013A	8.00	12277	112	<	141	MRC117	33.00	6798	137
102	TI0011	38.50	12276	23	<	142	GSA135	109.25	6782	15
103	FRM031	16.50	12244	160	<	143	TSC060V3	4.50	6602	229
104	MP00013	9.00	11939	128	<	144	FSC031	7.00	6602	50
105	FRC097	9.75	11876	498	<	145	CO7050	42.75	6372	131
106	GSC042V1	7.50	11833	274	<	146	UPX014	38.75	6350	266
107	FR1060	87.25	11575	136	<	147	USC026	20.00	6141	177
108	TR0035V	1.00	11568	277	<	148	TSC088	3.50	6012	159
109	GSC028	7.25	11302	74	<	149	SA1635Q	125.75	5961	62
110	MS0002	24.50	11184	163	<	150	TP5088	1.75	5947	149
111	TSC093	276.75	10530	46	<	151	RVR400	187.25	5896	193
112	UPA062C	1.75	10486	183	<	152	FE5034A	14.25	5851	193
113	MPM014F	1238.00	10408	31	<	153	FCC019	54.75	5758	198
114	R00330	1.75	10132	104	<	154	TGC017	15.25	5739	144
115	MP00012	3.50	9968	200	<	155	FCC017	14.00	5681	153
116	MP5011	18.50	9925	217	<	156	FY0007	7.00	5655	128
117	GSH052V	32.75	9791	97	<	157	TMA025	302.00	5431	176
118	TGC027	13.75	9723	135	<	158	GTC028	44.50	5408	238
119	TSC60V3	64.00	9546	151	<	159	GMD002	12.00	5087	32
120	458X3263				<	160			4955	223

RANKING REPORT: TOTAL O&S COST



# COMMUNICATIONS - ELECTRONICS

WORLDWIDE  
RANK THIS YEAR  
RANKING BY LOGISTIC SUPPORT COSTS  
COSTS EXPRESSED IN HUNDREDS OF DOLLARS  
RCS: HAF-LEY(A)8206  
PART 3  
J-D160A-RSX-RK-MRS  
PAGE 4  
AS OF 09-30-84

RANK THIS YEAR	TMS	WORLDWIDE AVERAGE ANNUAL INVENTORY	LOGISTIC SUPPORT COST	RANK LAST YEAR	<	>	RANK THIS YEAR	TMS	WORLDWIDE AVERAGE ANNUAL INVENTORY	LOGISTIC SUPPORT COST	RANK LAST YEAR
241	TT637U	54.75	126	258	<	>	281	TT774Q	107.25	62	392
242	SS30AG	185.00	121	385	<	>	282	TT628U	15.50	61	684
243	GRN025A	2.50	120	307	<	>	283	GSH13 14	11.25	60	331
244	RD0376VG	29.00	119	325	<	>	284	FRC0196	6.00	54	232
245	FY0028	7.00	118	270	<	>	285	FRC165V	12.00	51	376
246	FSH13V1	6.00	115	352	<	>	286	R1828V	29.00	51	378
247	FGC136	8.25	114	335	<	>	287	FY0086V	16.00	48	398
248	FS4004	1.50	114	303	<	>	288	UYK015V	4.00	48	314
249	TMO014	13.00	114	308	<	>	289	FS4088	17.00	47	712
250	FGC067X	15.75	113	720	<	>	290	FSC082	3.00	47	444
251	GSH019	18.00	108	268	<	>	291	FTC047	8.00	46	353
252	GPA123	16.25	107	277	<	>	292	GSH19AV1	5.00	44	380
253	TSC102	7.25	101	278	<	>	293	PRC047	00	44	104
254	UGC33AK	16.25	99	321	<	>	294	R1401A	19.25	44	383
255	CP1256VG	1.75	97	322	<	>	295	UN4017A	55.00	44	361
256	TI0002	52.00	90	363	<	>	296	FY0018	2.00	43	332
257	FSH009	4.00	89	261	<	>	297	FY0084	39.50	43	366
258	FRC114	1.75	88	301	<	>	298	RD0353	7.00	43	397
259	GY0039V1	.50	88	785	<	>	299	GSH052V	18.50	42	454
260	FRT060	7.50	85	448	<	>	300	GSH33V4	2.50	42	433
261	TI0003A	13.50	85	334	<	>	301	OA9034V	3.00	42	402
262	FTA013	5.00	82	360	<	>	302	TN4013	9.00	39	371
263	FRC158V	4.00	80	425	<	>	303	GGA010	3.00	38	417
264	GM0011	4.00	80	315	<	>	304	SS1A265	168.25	38	414
265	15347411	4.50	78	394	<	>	305	431	38.75	37	398
266	FRA090	3.50	78	319	<	>	306	FS4022V	3.00	37	369
267	R2130GRR	61.00	78	339	<	>	307	USC026	20.00	37	368
268	GGA015	48.75	77	338	<	>	308	TN4021A	8.75	36	420
269	RD0422Q	16.00	77	372	<	>	309	RD0240U	10.00	35	389
270	SS5G238	357.50	77	351	<	>	310	OO1 7411	11.50	33	377
271	SAT704G	64.50	74	336	<	>	311	R1625UR	16.75	33	415
272	TRC089	2.00	73	349	<	>	312	OL245GYC	11.50	30	407
273	UGC114	14.00	73	347	<	>	313	FSH13V2	2.25	29	410
274	TMO020	8.50	72	298	<	>	314	FY0061	3.00	29	453
275	GRN032	12.00	71	194	<	>	315	GXHO07	7.00	29	400
276	GSA092	8.25	70	300	<	>	316	OZ11A/TS	4.50	29	605
277	PDP11 45	1.25	69	374	<	>	317	RO1368	28.25	28	438
278	ML0644Q	10.00	65	355	<	>	318	FCC025	4.25	27	406
279	GM0004	5.25	64	388	<	>	319	GRN028	3.00	27	375
280	R1655URR	97.75	62	337	<	>	320	GSC038V2	20.00	27	658

RANKING REPORT: TOTAL LSC

# COMMUNICATIONS - ELECTRONICS

MMR/VAMCSC

PAGE 4

Q-D160A-R5X-RK-MRB

30-07-25

RANKING BY OPERATING & SUPPORT COST PER ITEM  
COSTS EXPRESSED IN HUNDREDS OF DOLLARS

AS OF 09-30-84

RCS: HAF-LEV(A)B208

WORLDWIDE										WORLDWIDE									
RANK	RANK	PER ITEM	RANK	<	>	RANK	THIS	TMS	AVERAGE	ANNUAL	INVENTORY	PER ITEM	LAST	RANK					
THIS	LAST	O&S COST	YEAR	<	>	YEAR	YEAR		ANNUAL	INVENTORY		O&S COST	YEAR	YEAR					
241	285	116	281	<	>	281	<	>	4.00	76	346								
242	387	115	282	<	>	282	<	>	7.00	74	335								
243	135	114	283	<	>	283	<	>	5.00	74	376								
244	76	114	284	<	>	284	<	>	1.75	73	280								
245	278	111	285	<	>	285	<	>	1.00	72	340								
246	238	110	286	<	>	286	<	>	16.00	71	358								
247	747	109	287	<	>	287	<	>	22.75	71	643								
248	310	108	288	<	>	288	<	>	11.00	70	539								
249	348	108	289	<	>	289	<	>	10.00	69	394								
250	317	106	290	<	>	290	<	>	224.75	68	378								
251	253	105	291	<	>	291	<	>	2.50	68	320								
252	293	103	292	<	>	292	<	>	14.75	68	331								
253	284	103	293	<	>	293	<	>	415.25	63	230								
254	235	103	294	<	>	294	<	>	5.25	63	371								
255	390	99	295	<	>	295	<	>	1712.50	61	302								
256	34	99	296	<	>	296	<	>	9.50	61	381								
257	313	99	297	<	>	297	<	>	17.25	61	326								
258	710	98	298	<	>	298	<	>	109.25	60	101								
259	424	97	299	<	>	299	<	>	52.00	59	373								
260	361	97	300	<	>	300	<	>	49.50	59	327								
261	345	96	301	<	>	301	<	>	1.00	59	351								
262	205	95	302	<	>	302	<	>	2.50	58	451								
263	265	95	303	<	>	303	<	>	5.00	58	389								
264	236	94	304	<	>	304	<	>	10.00	58	383								
265	126	94	305	<	>	305	<	>	23.75	57	647								
266	338	90	306	<	>	306	<	>	2.00	56	339								
267	329	89	307	<	>	307	<	>	4.00	56	420								
268	356	88	308	<	>	308	<	>	250.25	55	397								
269	319	84	309	<	>	309	<	>	9.75	55	515								
270	323	84	310	<	>	310	<	>	27.75	54	403								
271	472	84	311	<	>	311	<	>	64.50	53	97								
272	334	83	312	<	>	312	<	>	10.00	52	502								
273	324	83	313	<	>	313	<	>	4.00	51	355								
274	315	82	314	<	>	314	<	>	61.00	51	425								
275	199	82	315	<	>	315	<	>	42.50	51	641								
276	201	81	316	<	>	316	<	>	1.25	50	330								
277	105	80	317	<	>	317	<	>	16.00	49	374								
278	343	79	318	<	>	318	<	>	12.75	49	417								
279	562	79	319	<	>	319	<	>	562.50	49	377								
280	347	77	320	<	>	320	<	>	16.75	48	368								
				<	>		<	>											

RANKING REPORT: O&S COST PER ITEM

# COMMUNICATIONS - ELECTRONICS

MHL/VAMOSC RANKING BY LOGISTIC SUPPORT COST PER ITEM 86-07-25 0-D160A-RSX-RK-MRS PAGE 1  
COSTS EXPRESSED IN HUNDREDS OF DOLLARS PART 4 AS OF 09-  
RCS: HAF-LEY(A)8208

RANK THIS YEAR	TMS	WORLDWIDE AVERAGE ANNUAL INVENTORY	PER ITEM LOGISTIC SUPPORT COST	RANK LAST YEAR	< < < < <	> > > > >	RANK THIS YEAR	TMS	WORLDWIDE AVERAGE ANNUAL INVENTORY	PER ITEM LOGISTIC SUPPORT COST	RANK LAST YEAR
1	TPN019V	7.75	5512	10	<	>	41	FPN016A	7.00	469	45
2	MPQ00T2	1.75	4826	5	<	>	42	FRC098	19.75	458	59
3	FRR098	21.50	4342	1	<	>	43	TSC088	3.50	458	440
4	MPN014E	3.00	3930	16	<	>	44	FRC125	1.25	441	66
5	FRC117	3.25	3127	19	<	>	45	FPN018	10.25	428	39
6	MSC054	4.00	2768	9	<	>	46	CPN012	15.50	421	3
7	GSQ120V1	19.50	2605	65	<	>	47	TRN039	3.25	414	46
8	OY0059M	7.00	2478	12	<	>	48	MRC085	1.00	408	82
9	MPN014H	17.00	2261	4	<	>	49	GYK025V	1.00	367	165
10	OY0060M	7.50	2075	63	<	>	50	GPN025	2.00	310	93
11	MPN014G	9.00	2025	21	<	>	51	TRN031	31.00	310	85
12	TYC010	7.75	1685	31	<	>	52	TSC053	24.50	288	81
13	GMQ020	3.00	1361	24	<	>	53	FY0004	30.25	286	90
14	TTC030	19.25	1287	25	<	>	54	FRR075	15.75	280	72
15	FY0008	3.00	1249	35	<	>	55	TSW007	19.25	279	74
16	MPN011	3.50	1235	43	<	>	56	TSC60V4	8.25	273	80
17	MS0002	7.25	1202	15	<	>	57	TSC60V3	13.75	271	48
18	MPN014J	2.25	1140	29	<	>	58	GPN012	22.50	266	68
19	TPS04JE	56.25	1022	23	<	>	59	GIC021	1.00	257	91
20	FY0005	9.81	869	34	<	>	60	FY0008	7.00	255	87
21	MPN013A	8.25	869	26	<	>	61	MRC105V	2.25	235	61
22	TL0011	8.00	849	47	<	>	62	FPN062	33.00	221	38
23	OK2518M	14.25	839	57	<	>	63	TGC028	15.25	220	55
24	GAC001	4.00	790	42	<	>	64	TGC027	32.75	218	427
25	MS011A	2.50	773	50	<	>	65	TRN026	30.50	217	89
26	MPN013B	20.50	760	6	<	>	66	TPX042	60.50	209	107
27	GYK019	2.75	751	75	<	>	67	GRN027V	56.25	204	77
28	MPN014F	1.75	702	17	<	>	68	RPO274	1.75	185	814
29	FRC39AV	22.25	699	51	<	>	69	TRC097A	332.50	182	94
30	TS093V2	4.00	653	52	<	>	70	GYQ039V1	19.00	176	785
31	GPN020	26.25	638	40	<	>	71	TTC022	63.25	175	58
32	GRC189	1.00	629	99	<	>	72	TSC60V2	47.25	173	37
33	MS0077	16.75	600	32	<	>	73	TSC062	1.25	168	79
34	TSC60V1	54.50	582	49	<	>	74	MRC116	4.00	166	102
35	TRC144	1.25	544	97	<	>	75	TSC100	1.75	162	109
36	FRC126	1.25	519	84	<	>	76	UYQ013V	23.00	162	183
37	FPN047	17.25	509	68	<	>	77	GRN029	25.00	154	154
38	FY0059	3.00	494	86	<	>	78	TYC008V	1.75	145	153
39	TS0096	2.00	491	2	<	>	79	TPS068	1.00	142	148
40	FRC075	4.50	474	60	<	>	80	GSQ175	1.00	140	96

RANKING REPORT: LSC PER ITEM

# COMMUNICATIONS - ELECTRONICS

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86-07-25

RANKING BY PERCENTAGE CHANGE OF  
OPERATING AND SUPPORT COST FROM PREVIOUS YEAR

COSTS EXPRESSED IN HUNDREDS OF DOLLARS

AS OF 09-30-84

PART 5

RCS: HAF-LEY(A)8206

RANK	TMS	O & S COST		O & S COST		WORLDWIDE		PERCENT OF CHANGE
		THIS YEAR	LAST YEAR	THIS YEAR	LAST YEAR	INVENTORY	AVERAGE	
201	FPN016A	35312	26730	7.00	16.00	26730	16.00	32.108
202	G50080	13796	10459	250.25	256.25	10459	256.25	31.908
203	GPA131V	76525	58085	123.75	107.50	58085	107.50	31.747
204	TSC102	13364	10152	7.25	3.50	10152	3.50	31.639
205	F0C135	2907	2229	19.25	18.00	2229	18.00	30.417
206	CV3410	268	206	3.00	3.00	206	3.00	30.097
207	458X3263	9546	7352	64.00	33.00	7352	33.00	28.842
208	GRN035A	144	111	2.50	4.00	111	4.00	29.730
209	7481	506	392	15.25	17.75	392	17.75	28.082
210	S5TUB54	8	7	1.00	1.00	7	1.00	28.571
211	TDM1021	137	107	4.00	3.00	107	3.00	28.037
212	MRC108	15200	11884	224.75	254.00	11884	254.00	27.903
213	TTC030	42967	33624	18.25	19.75	33624	19.75	27.787
214	C95136	488	381	4.00	4.00	381	4.00	27.297
215	GRN020A	2724	2151	8.00	8.00	2151	8.00	26.639
216	MD10508	983	777	9.00	9.00	777	9.00	26.512
217	PPN018	3527	2799	94.50	100.75	2799	100.75	26.009
218	CV325BUR	413	329	9.00	9.00	329	9.00	25.532
219	GRN020B	37069	29623	74.50	75.00	29623	75.00	25.136
220	GRA039	1142	921	263.25	285.75	921	285.75	23.996
221	C10484G	145	117	8.00	10.50	117	10.50	23.932
222	F5A022V	647	525	3.00	3.50	525	3.50	23.238
223	R1623UR	809	659	16.75	12.75	659	12.75	22.762
224	CMO020	4308	3515	3.00	3.00	3515	3.00	22.560
225	AVW002D	120	98	4.00	4.25	98	4.25	22.448
226	TSC60V2	43365	35494	63.25	16.25	35494	16.25	22.176
227	OY0059H	20012	16465	7.00	7.00	16465	7.00	21.543
228	CV1689Q	377	312	3.50	5.25	312	5.25	20.833
229	UY0013V	7750	6449	4.00	4.00	6449	4.00	20.174
230	FRR098	98839	82385	21.50	13.25	82385	13.25	19.972
231	FPN047	100612	84134	17.25	22.25	84134	22.25	18.583
232	PRC025	1379	1155	167.50	197.00	1155	197.00	19.394
233	MRC105V	3806	3192	2.25	2.00	3192	2.00	19.236
234	FGT010	1358	1141	23.75	.....	1141	.....	19.108
235	C8210V6	194	163	20.00	17.50	163	17.50	19.018
236	FRC114	596	506	1.75	2.00	506	2.00	17.787
237	FTCO47	2021	1724	8.00	8.00	1724	8.00	17.227
238	R00353	109	93	7.00	6.25	93	6.25	17.204
239	TRO035V	11575	9947	87.25	92.00	9947	92.00	16.367
240	R1655URR	8124	7026	97.75	107.50	7026	107.50	15.828

RANKING REPORT: PERCENTAGE CHANGE IN O&S COST FROM THE PREVIOUS YEAR

# COMMUNICATIONS ELECTRONICS

RANKING BY PERCENTAGE CHANGE OF  
 LOGISTIC SUPPORT COST FROM PREVIOUS YEAR  
 COSTS EXPRESSED IN HUNDREDS OF DOLLARS  
 RCS: HAF-LEV(A)8206

06-07-78 0-3160A-RSX-RX-MRB

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RANK	TMS	LOGISTIC			WORLDWIDE			LOGISTIC			WORLDWIDE			PERCENT OF CHANGE
		SUPPORT COST THIS YEAR	AVERAGE INVENTORY THIS YEAR	SUPPORT COST LAST YEAR	SUPPORT COST THIS YEAR	AVERAGE INVENTORY THIS YEAR	SUPPORT COST LAST YEAR	SUPPORT COST THIS YEAR	AVERAGE INVENTORY THIS YEAR	SUPPORT COST LAST YEAR	SUPPORT COST THIS YEAR	AVERAGE INVENTORY THIS YEAR	SUPPORT COST LAST YEAR	
201	SSVD8002	9	13.25	8	13.00	13.00	50.000	50.000	50.000	50.000	50.000	50.000	50.000	
202	TS2844G	3	22.00	2	23.00	23.00	50.000	50.000	50.000	50.000	50.000	50.000	50.000	
203	TSC060V3	609	4.50	409	5.00	5.00	48.900	48.900	48.900	48.900	48.900	48.900	48.900	
204	GM0013A	7972	673.25	5370	673.75	673.75	48.454	48.454	48.454	48.454	48.454	48.454	48.454	
205	TSC053	7048	24.50	4755	28.00	28.00	48.160	48.160	48.160	48.160	48.160	48.160	48.160	
206	431	37	38.75	25	44.00	44.00	48.000	48.000	48.000	48.000	48.000	48.000	48.000	
207	SSLV020	19	4.25	13	4.75	4.75	48.154	48.154	48.154	48.154	48.154	48.154	48.154	
208	RVR400	1090	187.25	747	193.50	193.50	45.917	45.917	45.917	45.917	45.917	45.917	45.917	
209	F2231	16	4.25	11	4.00	4.00	45.455	45.455	45.455	45.455	45.455	45.455	45.455	
210	PT0008	650	348.25	448	315.75	315.75	45.089	45.089	45.089	45.089	45.089	45.089	45.089	
211	MRC108	12430	224.75	8593	254.00	254.00	44.653	44.653	44.653	44.653	44.653	44.653	44.653	
212	FRC098	93344	21.50	64728	13.25	13.25	44.207	44.207	44.207	44.207	44.207	44.207	44.207	
213	GSA135	2777	109.25	1930	108.25	108.25	43.886	43.886	43.886	43.886	43.886	43.886	43.886	
214	GSH035	12836	369.75	8964	368.00	368.00	43.195	43.195	43.195	43.195	43.195	43.195	43.195	
215	TRC089	73	2.00	51	3.75	3.75	43.137	43.137	43.137	43.137	43.137	43.137	43.137	
216	TRC150	539	7.75	378	7.00	7.00	42.593	42.593	42.593	42.593	42.593	42.593	42.593	
217	TLO011	6789	8.00	4764	9.00	9.00	42.508	42.508	42.508	42.508	42.508	42.508	42.508	
218	FRC096	9042	19.75	6357	18.00	18.00	42.237	42.237	42.237	42.237	42.237	42.237	42.237	
219	GM0032	1745	14.75	1228	20.50	20.50	42.101	42.101	42.101	42.101	42.101	42.101	42.101	
220	FPN047	8788	17.25	6186	22.25	22.25	42.063	42.063	42.063	42.063	42.063	42.063	42.063	
221	FRC185V	51	12.00	38	12.00	12.00	41.667	41.667	41.667	41.667	41.667	41.667	41.667	
222	GGA035	136	49.50	96	54.50	54.50	41.667	41.667	41.667	41.667	41.667	41.667	41.667	
223	GK001	3160	4.00	2244	3.50	3.50	40.820	40.820	40.820	40.820	40.820	40.820	40.820	
224	FY0007	743	7.00	528	7.00	7.00	40.720	40.720	40.720	40.720	40.720	40.720	40.720	
225	PPN018	2745	94.50	1951	100.75	100.75	40.697	40.697	40.697	40.697	40.697	40.697	40.697	
226	GRA083	440	177.00	313	199.75	199.75	40.575	40.575	40.575	40.575	40.575	40.575	40.575	
227	GSH036	1408	31.75	1001	28.00	28.00	40.460	40.460	40.460	40.460	40.460	40.460	40.460	
228	UGC114	73	14.00	52	14.00	14.00	40.385	40.385	40.385	40.385	40.385	40.385	40.385	
229	GPA030	1162	31.25	831	34.25	34.25	39.832	39.832	39.832	39.832	39.832	39.832	39.832	
230	FCC058V	845	36.50	605	34.50	34.50	39.669	39.669	39.669	39.669	39.669	39.669	39.669	
231	FY0008	3746	3.00	2684	3.00	3.00	39.568	39.568	39.568	39.568	39.568	39.568	39.568	
232	OY0059H	17343	7.00	12449	7.00	7.00	39.312	39.312	39.312	39.312	39.312	39.312	39.312	
233	ML0644G	65	10.00	47	9.25	9.25	38.298	38.298	38.298	38.298	38.298	38.298	38.298	
234	FSH13V2	28	2.25	21	3.00	3.00	38.095	38.095	38.095	38.095	38.095	38.095	38.095	
235	GRA115	161	203.00	117	200.50	200.50	37.607	37.607	37.607	37.607	37.607	37.607	37.607	
236	R1401A	44	19.25	32	19.25	19.25	37.500	37.500	37.500	37.500	37.500	37.500	37.500	
237	T10003A	85	13.50	62	13.50	13.50	37.087	37.087	37.087	37.087	37.087	37.087	37.087	
238	OL245GVC	30	11.50	22	.....	.....	36.364	36.364	36.364	36.364	36.364	36.364	36.364	
239	GTC028	1036	44.50	760	45.50	45.50	36.316	36.316	36.316	36.316	36.316	36.316	36.316	
240	FCC146	507	52.00	374	57.25	57.25	35.561	35.561	35.561	35.561	35.561	35.561	35.561	

RANKING REPORT: PERCENTAGE CHANGE IN LSC FROM THE PREVIOUS YEAR

## COMMUNICATIONS - ELECTRONICS

RANKING BY PERCENTAGE CHANGE OF PER ITEM  
OPERATING AND SUPPORT COST FROM PREVIOUS YEAR  
COSTS EXPRESSED IN HUNDREDS OF DOLLARS

RCS: HAF-LEV(AM)8208

AS OF 08-30-84

RANK	TMS	PER ITEM		WORLDWIDE		PER ITEM		WORLDWIDE		PERCENT OF	
		O & S COST		AVERAGE		O & S COST		INVENTORY		CHANGE	
		THIS YEAR		THIS YEAR		LAST YEAR		LAST YEAR			
241	PNA2855	21	8.00	17	8.00	23.558					
242	TRO035V	133	87.25	108	92.00	23.148					
243	FGC135	151	19.25	123	18.00	22.764					
244	CM0020	1436	3.00	1171	3.00	22.630					
245	FRR075	294	15.75	241	12.25	21.992					
246	OY0059M	2859	7.00	2352	7.00	21.556					
247	Y1358FGG	23	70.00	19	83.25	21.053					
248	FRR095	121	3.00	100	3.25	21.000					
249	082 7411	401	7.50	332	8.50	20.783					
250	FGC148	59	52.00	49	57.25	20.408					
251	UY0013V	1938	4.00	1612	4.00	20.223					
252	TSC100	2182	1.75	17713	1.50	20.149					
253	UPX023	99	19.75	83	15.75	19.277					
254	Y1774G	25	107.25	21	83.25	19.048					
255	PGA101A	563	4.25	474	5.00	18.776					
256	CP1057GR	19	6.25	16	11.75	18.750					
257	GS0078	210	59.50	177	74.00	18.544					
258	FTC047	253	8.00	215	8.00	17.674					
259	GSA092	374	6.25	322	7.00	16.149					
260	GPA131V	618	123.75	540	107.50	14.444					
261	RO0353	18	7.00	14	6.25	14.286					
262	GXH007	74	7.00	65	8.00	13.846					
263	FPS077V	140	358.50	123	353.00	13.821					
264	MST011A	6894	2.50	5061	1.00	13.744					
265	GSH024	58	5.00	51	9.00	13.725					
266	TFC101	83	8.00	73	8.00	13.699					
267	TD922AV2	84	5.00	74	5.00	13.514					
268	GSH018	160	19.00	141	26.00	13.475					
269	TC1503	163	12.00	144	12.00	13.194					
270	RO0355U	116	38.25	103	38.75	12.621					
271	QCM	9	2.00	8	2.00	12.500					
272	KR7524	72	1.00	64	1.00	12.500					
273	TCC003	28	15.25	25	18.00	12.000					
274	GRC117V	213	21.00	191	22.00	11.518					
275	CB210VB	10	20.00	9	17.50	11.111					
276	SSLV082	130	4.00	117	4.00	11.111					
277	FRC087	1327	9.00	1205	8.75	10.124					
278	CU2008U	11	2.00	10	2.00	10.000					
279	GM0011	22	4.00	20	4.50	10.000					
280	TRP026	786	30.50	718	32.00	9.471					

RANKING REPORT: PERCENTAGE CHANGE IN PER ITEM O&amp;S COST FROM THE PREVIOUS YEAR

# COMMUNICATIONS - EL COMINCS

RANKING BY PERCENTAGE CHANGE OF PER ITEM  
 LOGISTIC SUPPORT COST FROM PREVIOUS YEAR  
 COSTS EXPRESSED IN HUNDREDS OF DOLLARS  
 RCS: HAF-LEV(A)8208

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RANK	TMS	PER ITEM		WORLDWIDE		PER ITEM		WORLDWIDE		PERCENT OF CHANGE
		LOGISTIC SUPPORT COST THIS YEAR	LOGISTIC SUPPORT COST LAST YEAR	AVERAGE INVENTORY THIS YEAR	AVERAGE INVENTORY LAST YEAR	LOGISTIC SUPPORT COST THIS YEAR	LOGISTIC SUPPORT COST LAST YEAR	AVERAGE INVENTORY THIS YEAR	AVERAGE INVENTORY LAST YEAR	
241	TCC077	129	84	5.50	8.00	84	84	5.50	8.00	37.234
242	TRO035V	15	11	87.25	92.00	11	11	87.25	92.00	36.364
243	FRC075	474	349	4.50	4.00	349	349	4.50	4.00	35.817
244	MP000T3	133	98	16.50	12.50	98	98	16.50	12.50	35.714
245	FCC058V	23	17	36.50	34.50	17	17	36.50	34.50	35.294
246	GRN019	63	47	5.00	4.00	47	47	5.00	4.00	34.043
247	45BX3263	20	15	64.00	33.00	15	15	64.00	33.00	33.333
248	6PT2X10F	4	3	1.00	1.25	3	3	1.00	1.25	33.333
249	FRC165V	4	3	12.00	12.00	3	3	12.00	12.00	33.333
250	GPA131V	68	51	123.75	107.50	51	51	123.75	107.50	33.333
251	GRN028	16	12	59.50	64.75	12	12	59.50	64.75	33.333
252	GXH007	4	3	7.00	8.00	3	3	7.00	8.00	33.333
253	RO2174P	4	3	1368.25	527.00	3	3	1368.25	527.00	33.333
254	TCC007	8	6	115.25	120.25	6	6	115.25	120.25	33.333
255	TN4012	4	3	9.00	12.25	3	3	9.00	12.25	33.333
256	TN4021A	4	3	8.75	6.25	3	3	8.75	6.25	33.333
257	GRN0208	93	70	74.50	75.00	70	70	74.50	75.00	32.857
258	TFC097A	182	140	332.50	335.25	140	140	332.50	335.25	30.000
259	FRC096	458	353	19.75	18.00	353	353	19.75	18.00	28.745
260	FRC150	70	54	7.75	7.00	54	54	7.75	7.00	29.630
261	FRC109V	19	15	22.00	24.00	15	15	22.00	24.00	26.667
262	GSH036	44	35	31.75	28.00	35	35	31.75	28.00	25.714
263	TSW007	279	222	19.25	20.75	222	222	19.25	20.75	25.678
264	MSC054	2768	2224	4.00	4.00	2224	2224	4.00	4.00	24.460
265	GKCO01	790	641	4.00	3.50	641	641	4.00	3.50	23.245
266	GRN019A	134	109	121.50	118.00	109	109	121.50	118.00	22.936
267	GPA133	81	66	101.25	99.50	66	66	101.25	99.50	22.727
268	TSC60V1	582	481	54.50	59.00	481	481	54.50	59.00	20.998
269	GMO020	1361	1127	3.00	3.00	1127	1127	3.00	3.00	20.763
270	FCC025	6	5	4.25	4.00	5	5	4.25	4.00	20.000
271	FRR095	108	90	3.00	3.25	90	90	3.00	3.25	20.000
272	FSA022V	12	10	3.00	3.50	10	10	3.00	3.50	20.000
273	FTC047	6	5	8.00	8.00	5	5	8.00	8.00	20.000
274	PRC025	6	5	167.50	197.00	5	5	167.50	197.00	20.000
275	ROO355U	6	5	38.25	38.75	5	5	38.25	38.75	20.000
276	FRR075	280	234	15.75	12.25	234	234	15.75	12.25	19.658
277	TTC030	1287	1078	19.25	19.75	1078	1078	19.25	19.75	18.388
278	TTC007	27	23	14.75	14.00	23	23	14.75	14.00	17.391
279	GCC038V	7	6	68.00	66.00	6	6	68.00	66.00	16.667
280	GSO080	15	13	250.25	256.25	13	13	250.25	256.25	15.385

RANKING REPORT: PERCENTAGE CHANGE IN PER ITEM LSC FROM THE PREVIOUS YEAR

## COMMUNICATIONS - ELECTRONICS

RANKING BY OPERATING AND SUPPORT COST

86-07-25 Q-0160A-RSX-RK-MRS PAGE 4

PER ITEM/ACQUISITION PRICE RATIO

PART 9

COSTS EXPRESSED IN HUNDREDS OF DOLLARS

PCS: HAF-LEY(A)8208

AS OF 09-30-84

## WORLDWIDE

## AVERAGE

RANK	TMS	ANNUAL INVENTORY	PER ITEM OAS COST	ACQUISITION PRICE	RATIO
121	GM0002	12.00	413	299.66	1.378
122	GRA038	263.25	4	2.95	1.355
123	DS0008	69.25	8	5.95	1.344
124	DS0022	26.00	81	60.34	1.342
125	FRN031	38.50	319	237.66	1.342
126	302	17.50	114	85.25	1.337
127	SS1A523A	6.25	4	3.00	1.333
128	TS2608	6.00	3	2.25	1.333
129	TT54908	52.50	12	9.00	1.333
130	SSAV059	4.00	19	14.29	1.329
131	SSAV058	6.00	18	12.10	1.322
132	FCC019	54.75	105	80.20	1.309
133	FE5034A	14.25	404	308.58	1.309
134	GTC028	44.50	114	87.04	1.309
135	FTAO15	116.25	31	23.70	1.308
136	MODEL40	110.75	130	99.42	1.307
137	UGC114	14.00	13	10.00	1.300
138	2PTF815	4.00	110	84.65	1.299
139	PTO006	348.25	13	10.10	1.287
140	FGC148	52.00	59	46.00	1.282
141	RP0242VG	5.50	47	38.93	1.272
142	FGT010	23.75	57	45.00	1.266
143	FSC082	3.00	4783	3800.00	1.258
144	C8210VQ	20.00	10	8.00	1.250
145	SSCA260	2.00	1	.80	1.250
146	GSA092	6.25	374	300.00	1.246
147	GRN028	59.50	149	120.00	1.241
148	GCC037V	38.25	185	149.20	1.239
149	SKY515	172.25	26	21.01	1.237
150	GRN020C	56.25	652	530.00	1.230
151	GSH024	5.00	58	47.30	1.226
152	JJ3998	16.00	49	40.00	1.225
153	TT769	1.75	98	80.00	1.225
154	GSM253	42.00	20	16.45	1.215
155	TT359FGC	70.00	23	19.00	1.210
156	AM841G	11.00	42	35.00	1.200
157	GPM012	22.50	3361	2800.00	1.200
158	MO28ASR	577.75	27	22.50	1.200
159	SA2135VQ	11.25	18	15.00	1.200
160	SSDV048	20.50	3	2.50	1.200

RANKING REPORT: RATIO OF OAS COST PER ITEM/ACQUISITION PRICE



## COMMUNICATIONS - ELECTRONICS

 RANKING BY LOGISTIC SUPPORT COST  
 PER ITEM/ACQUISITION PRICE RATIO  
 COSTS EXPRESSED IN HUNDREDS OF DOLLARS

 RGS: HAF-LEV(A)8208  
 AS OF 08-30-84

RANK	TWS	WORLDWIDE AVERAGE ANNUAL INVENTORY	PER ITEM LOGISTIC SUPPORT COST	ACQUISITION PRICE	RATIO
81	GG4035	42.50	3	11.15	.259
82	TA312PT	8017.50	1	3.71	.269
83	GM0023	41.25	4	15.00	.268
84	GT0028	44.50	23	87.04	.264
85	FYA081V	1.00	13	50.00	.260
86	GRN026	3.00	9	35.00	.257
87	GRN019A	121.50	134	530.00	.252
88	C9141GY	10.00	25	100.00	.250
89	OY0059M	7.00	2478	10000.00	.247
90	GM0030	2.00	6	24.38	.246
91	GRN027V	56.25	204	854.14	.238
92	MODEL40	110.75	23	99.42	.231
93	GRC115	8.75	114	500.00	.228
94	FY0058	3.00	494	2180.00	.226
95	TM0017	3.00	7	30.90	.226
96	GRA115	203.00	1	4.54	.220
97	URC103	3.50	53	240.00	.220
98	FGC146	52.00	10	46.00	.217
99	SSH269	8.75	1	4.65	.215
100	VRC048	245.25	5	33.19	.215
101	GIC021	1.00	257	1200.00	.214
102	GRN020C	56.25	112	530.00	.211
103	TT359FGC	70.00	4	19.00	.210
104	MRC107	298.50	77	369.73	.208
105	TS0061	25.00	132	631.68	.208
106	GM0013A	673.25	12	58.34	.205
107	FRN037	3.00	62	303.70	.204
108	MRC108	224.75	55	273.07	.201
109	PT0008	348.25	2	10.10	.198
110	GG4015	48.75	2	10.35	.193
111	FRC015	4.50	474	2500.00	.189
112	FS4004	1.50	76	402.00	.189
113	MPN014E	3.00	3930	20763.00	.189
114	GRC175	285.25	10	53.52	.186
115	R00422Q	16.00	5	27.04	.184
116	TRC144	1.25	544	3000.00	.181
117	TT471FGC	60.25	4	22.06	.181
118	TM0020	8.50	8	44.40	.180
119	URC032	195.25	17	96.43	.176
120	GRN0208	74.50	93	530.00	.175

RANKING REPORT: RATIO OF LSC PER ITEM/ACQUISITION PRICE

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## COMMUNICATIONS - ELECTRONICS

HISTORICAL COST YREND  
 RCS: WAF-LEV(A)10207

07-22-86

0-01601-A-0(A-01-000)

1-11-67 10 50

COSTS EXPRESSED IN HUNDREDS OF DOLLARS

**TMS: 654035**

LINE ITEM	COST	RANK	TOTAL COSTS CHANGE PERCENT	COST RANK	COSTS CHANGE PERCENT	PER END ITEM RANK	COST/ACQUISITION RATIO
6082	359						
REPLACEMENT SUPPLY							
REPLACEMENT SUPPLY	110.496	14	100.000	483	100.000	483	6.977
REPLACEMENT SUPPLY	85.585	10	100.000	483	100.000	483	541.795
							36
							12

[illegible][illegible]

C-E HISTORICAL COST TREND REPORT

#### ATTACHMENT 4

##### COSTCASTER: COST-PREDICTION/TRADE-OFF MODEL FOR GROUND C-E EQUIPMENT

COSTCASTER is a computerized cost analysis decision aid developed for the Air Force Logistics Command by Desmatics, Inc. It helps in deciding whether to modify, replace or retain items of Air Force ground communications-electronics (C-E) equipment.

COSTCASTER, which has been implemented in prototype form on the Zenith Z-100 and IBM PC microcomputers using LOTUS 1-2-3 software, is designed for ease of use even by persons having no computer experience. Menus are displayed at every major decision point to guide the user through the interactive cost analysis sessions.

COSTCASTER is designed to use a historical data base of operating and support (O&S) cost information derived from the Air Force VAMOSC system. COSTCASTER uses statistical methods to predict O&S costs for individual types of C-E equipment items based on the historical cost data.

COSTCASTER trade-off analysis allows the user to compare the predicted O&S costs for an existing item of equipment with the costs expected to be incurred by an alternative item (i.e., a replacement or modification). To perform a trade-off analysis, the user provides estimates of a few quantities, such as the expected economic life of the alternative item. (Default estimates, supplied by COSTCASTER, may be used if desired.) COSTCASTER makes it easy for the user to experiment with alternative sets of estimates and to assess the results.

COSTCASTER provides immediate output in the form of tables and graphs which summarize the results of the cost prediction and trade-off analysis. These tables and graphs, which are displayed on the computer screen, may also be output on the printer.

APPENDIX C: DETAILED COMMENTS FROM CIVIL SOCIETY

11 MAR 1987

Desmatics, Inc.  
P.O. Box 618  
State College, Pennsylvania 16804

Dear Gentlemen:

The attached questionnaire you provided for our review has been completed per your request. In addition to the responses to the questionnaire, we believe a number of issues/problems must be addressed before a viable C-E cost data base can be established.

a. Aggregation Process. There are no reports which aggregate the equipment level data to a system level and/or a base level. This situation, in addition to providing gaps in the data, exacerbates the allocation problem.

b. Allocation Process. A total of 13 cost elements listed in attachment 1 were obtained through an allocation process rather than a direct measure. While I understand the necessity for deriving cost expenditures by allocation, this should not be done unless a logical basis for the allocation can be established. Some costs are not allocatable below the system and base level. To artificially allocate these costs below this level tends to distort the data and mask the uniqueness of costs associated with each item of equipment.

c. Logistics Support Costs. Aggregating costs by general categories, such as, logistics support cost, decreases clarity and leads to misuse of the data. Logistics support cost is a much used term whose meaning varies with each application. Although it could be adequately defined for your use, its misuse in other applications would continue to confuse the users and lead to misuse of the data.

d. Missing Data Elements. There are a number of data elements which do not appear in any of the reports furnished. While not all equipment would incur expenditures in all of these cost elements, some equipments would incur costs and in many cases these costs would be significant. The following elements should be included: TCTO (procurement and installation), engineering change proposals or sustaining engineering, contract unit level support, support equipment replacement and spares.

Generally, the formats presented appear to be designed to maximize the page output. Data is fragmented and redundant headings are repeated. This

makes the data awkward to use and time consuming to retrieve. An effort should be made to maximize the data density and group similar systems for ease in comparative analyses.

The foregoing comments do not detract from the usefulness of the data, however, the failure to accommodate these concerns will severely limit the utility of the C-E VAMOSC system.

Enclosures:  
As Stated

cc: AFLC/ACCV

## ATTACHMENT TO C-E QUESTIONNAIRE

12a. It would appear that quarterly inventory changes at the NSN level of detail would be too finite for use by cost analysts and item managers would have this information from existing reports. This data should be aggregated to an annual basis and probably limited to the top five cost drivers.

12b. The format for this report appears rather awkward to use. Is the "normalized" column a cost per unit? Is this a trend report listing all fiscal years in the data base? Would it be more appropriate to organize this type of data by base rather than by TMS? Aggregated data by TMS should be listed in the following format for efficient retrieval.

<u>TMS</u>	<u>FY</u>	<u>Cost Element</u>	<u>Cost Element</u>	<u>Total</u>
GSH035	84	-	-	-
	85	-	-	-
	86	-	-	-
SSTS831	84	-	-	-
	85	-	-	-
	86	-	-	-

As a general rule the more dense the data, the easier it is to use.

12c. See 12b, for format. If this report is intended to be AFSC specific, an additional column can be added. The Total Annual Direct manhours/AFSC appears to be out of place. If this information is useful suggest a separate report listing all AFSCs. The Base Labor Allocation Factor shows no relationship to other data in the report. How is this factor used?

12d. This report appears to list all LRUs of the end item regardless of depot activity. Suggest the the report be limited to only those having some depot action and that the TMS listed in the first column. Further suggest a sequence be established for the TMS listings and used throughout the reports (except those reports that rank). The recoverable allocation factor should be the percentage of units repaired against the units condemned. This factor times the quantity times the unit costs (see 8118 report) should provide the replenishment spares costs. When NSNs are common to more than one system (both C-3 and others) the allocation factor should be indicated. This factor could be based on end item inventory, operating hours, repairable generations of the specific systems (NRTS), etc. Allocated Depot Maintenance Costs should be broken into Maintenance, Overhead and Material Management; one based on the workload and the other on an item count. If the source data permits, the program costs should be broken into labor and material.

12e. This report should be combined with 8120.

12F. What constitutes a "one-way" and round trip? Why is Recon Alloc Factor listed on this report? Why are the allocated Pkg and Trans Cost normalized on the inventory and not the quantity shipped? If the inventory does not vary with the line entries it should be listed in the heading; only items that vary should be listed in the columns.

12g. TMS should be listed in column 1.

12r. To improve the utility of this historical data suggest it be condensed to one line per fiscal year. The format could be as follows:

<u>Item</u>	<u>FY</u>	<u>Inn.</u>	<u>O&amp;S COSTS</u>	<u>Logistics Costs</u>
	82	359	110,496	85,585
	83	368	94,667	8,964
	84	369	35,104	12,836

etc.

The percent change and ranking, although of value on the annual reports, serve no purpose in a report of a ten year cost trend. This condensed data will provide the trend at a glance and will greatly facilitate the retrieval and use of the data.



END

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FEB. 1988

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